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THE
Tramway AND Railway World

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SATURDAY, JANUARY 4, 1919.

PRICES AND WAGES.

THE after-war outlook of American electric railways in regard to prices of materials and the payments to labour has engaged considerable attention. On December 31 the fixing of prices by the War Industries Board came to an end, and in anticipation of that event the rail makers on December 9 agreed upon a new schedule of prices, which became operative on standard T-rails. Open hearth rails in 100 to 500-ton lots were $57, and bessemer rails $55, as against $65 and $63 respectively under control. This is the first time for many months that any revision has taken place. The price in 1913, 1914 and 1915 averaged $28 per ton. In 1916 the average was $30, and for 1917 up to November $33, when $38 was reached. At this sum the price remained until the War Industries Board fixed the charge. It has, however, been next to impossible for electric railways to obtain any rails during the past two years. The new prices do not affect the price of girder rails, which has not changed during the past year, but has more than doubled since the war began. More than one manufacturer has hinted that the reduction is a forerunner of others as the mills work off their back orders, but the makers generally look forward to bringing the market price nearer to normal gradually, in order not to disturb the market unduly. That further reductions are likely to be very gradual is probable, for the reason that stocks of raw material were purchased at high prices, while the payments to labour show no sign of coming down, and the demand for reconstruction of tracks will be universal. As to copper, producers looked for an immediate slump, but when business quickens prices are expected to harden, and then advance. As it is doubtful if buyers will accept the increase for long, another drop is then expected. Of wages of car employees, the *Electric Railway Journal*, of New York, has something to say which is applicable to the new demands of the unions in this country. Mr. Walsh, recently joint chairman of the War Labour Board, has stated that labour must not be expected to return to the pre-war basis of wages and working hours, and that the costs of necessities are not likely within five years to reach the old level. It is pointed out that no industry will be so handicapped as electric railways in meeting the standard of 72½ cents an hour, based on an eight-hour day, which Mr. Walsh regards as a satisfactory wage minimum. The *Journal* concludes that Mr. Walsh was referring to general industry, not to electric railway conditions, and that, if he had had the latter in mind, he would have modified his reference to the eight-hour day, because of the fact, recognised in his own electric railway decisions, that no one has yet been able to devise operating schedules in which an eight-hour shift can be utilised economically to meet the peak-load requirements. It could only be done by adding a prohibitive burden to the cost of hauling passengers. Assuming that labour might be satisfied with a ten-hour day at 58 cents an hour, to give the equivalent of 72½ cents for eight hours, the question arises as to how the average electric railway could pay even such a wage? In the past few years this item of operating expense has increased for the average company from 26 to 40 per cent. of the revenue.

DEATH OF MR. STEPHEN SELLON.

We deeply regret to record the death of Mr. Stephen Sellon, M.Inst.C.E., which occurred suddenly on December 21, while he was travelling to London from Edinburgh. He had been engaged in the Scottish capital in the Arbitration proceedings between the Corporation and the Tramways Company, on the price to be paid by the City Council for the rolling stock, etc., of the company's undertaking. In Mr. Sellon's death the tramway world suffers a loss that will long be felt. On the engineering side, he was a pioneer of electric traction and for the past twenty-five years and more he had done valiant service in the development of tramway and light railway facilities in this country. In these days it is difficult to realise the strength of prejudice and the force of the inertia which the early pioneers had to overcome in introducing electric traction. Mr. Sellon in a few years became the best known expert witness in tramway Bill investigations by Committees of the Houses of Parliament and at light railway inquiries by the Light Railway Commissioners. The last Parliamentary Bill in which he appeared related to the Sheffield Corporation's application last session for powers to carry goods on the tramways. Mr. Sellon was the chief witness on behalf of the railway companies, and it is not too much to say that his evidence on the financial aspects of the scheme was mainly the cause of the Committee refusing to grant the full powers for which the Corporation applied. In early life he gained railway engineering and main drainage experience, and was also engaged on the construction of the Barry Railway and the Manchester Ship Canal, but from 1893 he devoted his attention almost wholly to electric tramways and light railways, varied by work on several Irish relief railways for the Irish Light Railway Commission, and by the construction of the Wolverton and Stony Stratford Light Railway, and the Newport Pagnell Tramways. Mr. Sellon was responsible for the introduction of electric traction in Leeds, where he was given a concession to electrify the Roundhay line, the work being carried out by the British Thomson-Houston Company. This line on which service was begun in November, 1891, not only proved successsful but it also served the useful purpose of a demonstration to local authorities and others of the advantages of electric traction. After service on the Board of Trade Committee, which framed the Light Railways Act of 1896, Mr. Sellon was responsible for the equipment of numerous electric tramways carried out by the British Electric Traction Co., and was consulting engineer to a number of tramway companies and municipal authorities. He also gave evidence before the Royal Commission on London Traffic. He was consulting engineer to the Bristol Tramways Company, the London United Tramways, the Metropolitan Electric Tramways, the North Metropolitan Electric Power Supply Co., the South Metropolitan Electric Tramways and Lighting Co., etc. He prepared all the traffic estimates for the London Tube Railways. He was an active member of the Tramways and Light Railways Association, and of late years he had devoted great attention to forwarding the case for reform in tramway and light railway legislation, and he gave evidence before the Committee on Electrical Industries whose important report was issued last year. He performed most valuable work as a member of the Board of Trade (Tramways) Committee, upon which his geniality conduced greatly to the despatch of the arduous work upon which the committee was engaged.

Track Maintenance at Halifax.—The Corporation intend to carry out repairs to the tramway track between Hipperholme and Brighouse and between Brighouse and Bailiffs Bridge.

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NEW YEAR'S DAY SERVICES IN SCOTLAND.

Although the employees of the Edinburgh and District Tramways Company and the Scottish Motor Traction Company declined to work on New Year's Day, and so left the public without the services of either tramway cars or omnibuses, at Glasgow, where the men are members of a different union, the usual service was given. The Edinburgh Tramways Company made an offer of time and a half as an inducement to the men to maintain the service as usual, but the employees declined the offer. The attitude of the company was that the men and women employed in running the Edinburgh cars were not in the same position as the general body of industrial workers, but were more directly the servants of the public, and as the tramway was run as a public utility service the public were in the directors' opinion, entitled to the use of the cars on a general holiday as well as on other days. The company considered themselves bound by their lease to provide an adequate service of cars on New Year's Day and other holidays, and they held that their employees had taken service with them on that understanding.

At Leith, the cars were run on New Year's Day, the employees having given an undertaking that they would attend to their duty.

Dundee cars ran on New Year's Day, though employees at first had talked of a holiday. They, however, agreed to work pending a decision on an application for pay at the rate of time and a half for all holidays.

HEAVY MOTOR TRAFFIC.

The minutes of evidence taken before the Departmental Committee on the law and regulations relating to the construction and use of road locomotives and heavy motor cars in Great Britain were issued on Thursday as a blue book (H.M. Stationery Office, 3s. 6d.). The report of the Committee, making various recommendations, was published in the middle of December. The minutes of evidence, extending to nearly 400 foolscap size pages, contain much interesting matter. The witnesses who dealt with motor omnibuses and other problems in London included Sir Albert Stanley, who spoke in his capacity as managing director of the London General Omnibus Company; Mr. W. J. Iden, formerly chief engineer of that company; and representatives of the London County Council and the Metropolitan Police.

Sir Albert Stanley said that if roads were properly constructed in the first place, which could be done at a reasonable cost, and were properly and promptly repaired, they were perfectly competent to carry the class of traffic sent over them by the London General Omnibus Company without any undue damage. No case had been made for the reduction of the weight of the present motor omnibus. On the contrary, their experiments went to show that a slight increase in the present weight, say about half a ton, would result in some benefit to the roads. The maximum speed limit should be increased to 16 miles per hour. A reduction of the speed limit from 12 to 10 miles an hour would necessitate an addition of 203 omnibuses to their fleet if they were to keep up the service given to the public at 12 miles. With regard to the general right to use roads and the licensing of vehicles, they were perfectly satisfied with the present condition of things, but if some form of control was to be established the local authorities and the Local Government Board should have the power to veto, without condition, heavy motor cars on certain roads. Licensing should be vested in the hands of an authority in charge of a very wide area, and, subject to the fulfilment of scheduled conditions, should become automatic.

Mr. Iden said that whatever the speed of a motor omnibus it had no peculiar or damaging effect on the road surface. He considered that 70 per cent. of the London roads used by the company's omnibuses were fit for heavy motor traffic. The control and mechanism for starting a motor-omnibus was capable of improvement.

Mr. G. W. Humphreys, chief engineer of the London County Council, spoke as to the decreased life of roads owing to heavy motor traffic.

Colonel Crompton advocated the use of large diameter wheels.

Mr R. J. Howley considered the roads could be made to bear the traffic of heavy cars, but thought the weight per axle should not be increased.

Numerous other witnesses were examined.

INCREASE IN TRAMWAY FARES.

Fares on the London United Tramways were raised on January 1. The Middlesex County Council have given their consent to the Metropolitan Electric Tramways Company for the alteration of existing fares. Threehalfpenny stages have been done away with and the other changes are as follows:—Ordinary Passengers,—Any three consecutive stages, 1d.; any six consecutive stages, 2d. any nine consecutive stages, 3d. Workmen's Fares.—Return tickets on all cars completing journeys before 8 a.m., available for return at any time on the day of issue; Ordinary stage, 2d.—Workmen's single, 1d.; Workmen's return, 2d. 3d. fare—2d., 3d. return. 4d. fare—2d., 4d. return. 5d. fare—3d., 5d. return. 6d. fare—3d., 6d. return. 7d. fare—3d., 6d. return. 8d. fare—3d., 6d. return.

The Leeds City Council has adopted the recommendation of the Tramways Committee that the Town Clerk be instructed to apply for Parliamentary powers to charge fares at the rate of 1d. per mile or fraction of a mile, with a minimum charge of 2d. for any distance exceeding two miles, and to increase the schedule of rates for the conveyance of goods and parcels by 100 per cent.

RECONSTRUCTION OF PORTSMOUTH TRAMWAYS.

Mr. W. R. Spaven, general manager of Portsmouth Corporation Tramways has submitted to the Mayor, Mr. John Timpson, who is also chairman of the Tramways Committee, a memorandum dealing with the necessary reconstruction and extension of the tramway system.

The memorandum states that a very large amount of work will have to be taken in hand, so soon as arrangements can be made. Mr. Spaven says:—"The returns for this year show an increase over the pre-war year (1914) of about 14,000,000 passengers, which works out at 17·7 per car mile. To deal with this traffic we have 100 cars, and during last summer we had an average of 92 cars in daily service, leaving the small margin of 8 for general overhauling purposes, and the carrying out of ordinary running repairs, which clearly shows that our present rolling stock is altogether inadequate to meet the traffic demands.

"If this traffic is maintained, and I see no reason why it should not be so, and in view of what may take place in Portsmouth during the coming summer, and as there is no possibility of obtaining any additional new cars for some time to come, we shall be faced with a very serious traffic problem, and the only solution of the same is, in my opinion, for the Committee to consider the advisability of obtaining, if possible, some motor buses, which could be run from outlying districts to the centre of the town, through thoroughfares quite clear of the tramway route.

"These buses would also be useful when the reconstruction of the track is taken in hand, for conveying people when the car services are disorganised."

The schedule of work that Mr. Spaven recommends should be taken in hand at the earliest practical moment is as follows:—

REPAIRS AND RENEWALS.—Permanent way, overhead equipment, cars.

NEW WORK.—Cars (top roof covers and vestibules); car shed; converting some of the old cars into the toast-rack type; extension of tramways:—(*a*) Milton and Hilsea. (*b*) through Chicester Road, linking up London Road and Copnor Road, (*c*) through St. Michael's Road, linking up main line and Floating Bridge line with Park Road section; alterations at the Town Hall and other parts for dealing with the traffic; Bradford junction; motor buses.

MISCELLANEOUS NEWS AND NOTES.

Wigan Tramway Traffic was dislocated at the close of the year by heavy floods which have affected the whole district.

Nationalisation of Melbourne Tramways.—The Legislative Assembly of Victoria has voted against the nationalisation and state control of the Melbourne tramways.

Proposed Sheffield Extension.—Sheffield Tramways Committee are considering the desirability of extending some of the tramway routes. A line has been proposed from Race Common to Rossington.

Melbourne Electric Railway.—The first train was run over the Melbourne and Flemington Electric Railway at the end of October, but it is not anticipated that a full service will be available for some months.

Doncaster Tramway Extension.—Doncaster Corporation have informed the Local Government Board as to the public works which they wish to carry out in the near future. Tramway extensions are third in the list of priority, the first two places being given to housing and water supply developments.

A Proposed Light Railway.—Kincardine Parish Council have agreed to petition the Board of Agriculture and the Western District Committee of Perth County Council, in favour of the construction of a light railway from Stirling to Port of Menteith. The line would pass through a fine agricultural district.

Motor Omnibuses for Wallasey.—The Tramways Committee of Wallasey Corporation proposes to purchase a number of new tramway cars and ten motor omnibuses. The idea is to afford additional facilities and to relieve the tramways by using omnibuses for passengers travelling to points beyond the tramway termini.

Omnibus Developments at Worthing.—Southdown Motor Services Ltd., has informed the Worthing Town Council that they propose to lay before them plans for various improvements in the motor omnibus services. Among other extensions it is intended, as soon as the present restrictions are withdrawn, to provide services to the outlying villages of Goring, Sompting and Lansing.

Institution of Electrical Engineers.—Mr. M. B. Field, O.B.E., will read a paper on "The Navigation (Magnetic) Compass as an Instrument of Precision" at the meeting of the Institution of Electrical Engineers on Thursday, January 9, at 6 p.m. The meeting will be held at the Institution of Civil Engineers, Great George Street, Westminster, S.W.

More Petrol Available.—Though the restrictions on the use of motor cars have been removed altogether, the Petrol Control Department has not yet dispensed with the system of licences to obtain motor spirit. Under the Finance Act, 1916, a duty is payable by holders, and until the Act is repealed by Parliament licences will continue to be necessary. New applicants, will, however, have no difficulty in obtaining licences. The quantities of spirit that the Department is prepared to allocate to existing licence-holders are now very much greater—in fact it is announced by the Department that no reasonable requests will be refused. The Motor Spirit Restriction Orders will be revoked entirely by the Board of Trade from January 10.

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Workmen's Cars Services.—Considerable modifications in the times of workmen's cars seem to be necessary in many towns owing to the reduction of the standard week in the engineering and allied trades to 47 hours. In some localities arrangements are already being made between the engineering employers and the tramway authorities as to revised times for the workmen's cars services.

Proposed Light Railways at Aberdeen.—The construction of a light railway between the electricity works and the docks and railway station for the conveyance of coal, at an estimated cost of £20,000, has been recommended by the Aberdeen Corporation Electricity Committee.—Huntingdonshire County Council has asked the Norman Cross Brick Company to co-operate with them in the promotion of a light railway for the district.

Strike on the L. & Y. Railway.—The engineers at the Formby power station of the Lancashire and Yorkshire Railway, which provides power for the service between Liverpool and Southport, struck on Thursday night at ten minutes' notice. The labourers also struck in sympathy. As a consequence the trains between Liverpool and Southport had to be hauled by steam locomotives and the passenger compartments were in total darkness between stations.

National Transport.—It has been stated that before the Government went to the country, Sir Eric Geddes was deputed, in consultation with Sir Albert Stanley, to draw up a scheme of national transport services in which a system of State railways would be linked up with canals, motor transport, and aerial and sea services, not necessarily publicly owned. It is rumoured that Sir E. Geddes will be the director of a new department of inland, sea and overhead transport.

Strike at Blackburn.—Unless a settlement of the tramway strike at Blackburn is arranged by this week end, a serious development is threatened throughout the whole of Lancashire, as the Blackburn strikers are demanding a general strike in the district. At Blackburn the service was run on Christmas Day and the tramway employees throughout Lancashire appear to be determined to use the whole influence of their Association in order to prevent a similar thing happening in future.

Okehampton to Torrington Light Railway.—The Okehampton Town Council has referred to the General Purposes Committee a proposal that application should be made to the Local Government Board and the Devon County Council asking them to secure railway material from surplus Government stock for the construction of a light or standard gauge railway from Torrington to Okehampton and that the several parish councils interested should be asked to make similar application.

Payment of Insufficient Fare.—A woman passenger on one of the London County Council cars was recently fined forty shillings and two guineas costs for travelling beyond the distance for which she had paid her fare. The defendant entered the car at Blackfriars Bridge and took a penny ticket, which entitled her to travel to Kennington Gate. Instead of alighting at that point, she travelled to Gresham Road, Brixton, and left the car without paying the additional fare, when she was stopped by one of the Council's inspectors who had been watching her. The defendant said that she forgot to pay the extra fare.

A National Joint Council.—Some months ago it was hoped that a National Joint Council for the tramway industry might be established without much delay. The draft constitution which had been approved by representatives of the men and the Councils of the Municipal Tramways and the Tramways and Light Railways Associations was submitted to the members of the Municipal Tramways Association at the conference in Leicester in September last. Some of the employees' local unions have, however, raised objections to the scheme and the London section of the Amalgamated Association of Tramway and Vehicle Workers has rejected the proposal. Unless the constitution is accepted throughout the industry it will, of course, be impossible to form a National Council as was proposed. National Joint Councils have already been formed in forty-seven trades.

Sunday Service at Broughty Ferry.—The Dundee magistrates have agreed to the proposal of the Dundee, Broughty Ferry, and District Tramway Company to run a continuous service on Sundays, cutting out the present stoppage between 11 a.m. and 1 p.m. Mr. Edward Cowan, secretary of the Company, intimated that if the request was not acceded to, the directors intended to arrange that the service on Sundays would not commence until one o'clock in the afternoon. The public strongly desired a continuous service. Mr. G. A. Johnston, convener of Dundee Tramways Committee, said his committee had no objection to the change. Indeed, they themselves would be making a similar proposal. Mr. Peter Fisher, manager of Dundee tramways, said that if there was no strong sentimental objection it would be a great public advantage to have a continuous service.

Ayr Tramways and Insurance.—At a recent meeting of Ayr Town Council a letter from the Tramways Committee was read with regard to insurance, together with a letter from t .e Law Accident Insurance Society. The Society said that for three years ended Whit Sunday, 1918, the claims paid amounted to £927, whereas the insurance premium was only £589. They were prepared to renew the policy for another year at an increase of 33⅓ per cent. on the premium, the present rate being 22s. 6d. per cent. The Council decided to renew the policy for a year on the terms proposed, and have agreed to the suggestion of the Insurance Company that the Corporation should employ a thoroughly qualified independent tramway engineer to make an examination of the whole plant, overhead wires, cars, etc., and to state whether in his opinion the inspection and repairs are efficient. The general manager of the Glasgow Corporation tramways, or, failing him, the general manager of the Leeds Corporation tramways, is to be asked to recommend a suitable engineer to make the inspection and to report thereon.

PERSONAL.

Mr. Cecil Leigh, F.I.C., chief chemist of the Birmingham Metal and Munitions Co., Ltd., has been appointed general manager of Thermit, Ltd.

Mr. W. MacGibbon has been appointed manager of the Mexborough and Swinton Tramways Company. He has been manager of the Dewsbury and Ossett Corporation and Soothill Nether Urban District Council Tramways.

Private Williamson, Seaforth Highlanders, who has been awarded the Military Medal, was prior to enlisting a car driver in the employment of the Dundee, Broughty Ferry, and District Tramways.

Messrs. W. J. Ritchie and Company, of Freedom Works, John Street, Sheffield, manufacturers of tramway and wagon axles, cranks stampings, etc., notify us that their London office has been removed to Dashwood House, 9, New Broad Street, E.C.2.

Mr. A. H. Shaw, electrical engineer of Ilford, and **Mr. L. E. Harvey,** tramways manager, have been authorised to arrange for a supply of electric current from neighbouring tramway authorities with a view to meeting emergencies in breakdowns.

Bombardier W. Simmons, R.G.A., who has been awarded the Military Medal for bravery in the field, was a motorman in the employ of Burnley Corporation Tramways when he enlisted in October, 1914. He went to the front in November, 1916.

Superintendent A. E. Bassom, of the Pubic Carriage Department of the Metropolitan Police, was one of the twenty-four police officers in England who were awarded the King's Police-Medal among the recipients of honours announced on New Year's Day.

Mr. Evan Parry, whose resignation of the post of Chief Government Electrician of New Zealand was mentioned in our issue of December 21, has been appointed engineer-in-chief of the English Electric Manufacturing Company, particulars of which are given elsewhere in this issue.

Sir George Gibb has, it is stated, resigned the salaried post of chairman of the Road Board, which he has held since its formation in 1910. He is, it is added, accepting the position of Consulting General Manager of the North Eastern Railway, of which he was solicitor for many years and General Manager from 1891 until 1906.

Mr. Rees Jeffreys has resigned the chairmanship of the Road Board to accept the position of financial adviser to the Motor Union Insurance Company, Ltd., of which he was one of the founders and original directors. He has also been elected chairman of the Federated British Insurance Company, Ltd.

Mr. Frank Buckley, general manager of the Wigan Corporation tramways, has been appointed general manager of the Bury tramways department, in succession to Mr. William Clough, who recently resigned to join an important syndicate in the paper making industry Before becoming manager of the Wigan tramways six years ago, Mr. Buckley was assistant to the general manager of Salford Corporation tramways.

Mr. R. L. Acland, chief electrical engineer to Chesterfield Corporation for the last 18 years and manager of the tramways for nearly as long, has been presented by the staff with a gold watch on the occasion of his leaving Chesterfield to take up the management of a firm engaged in motor transport work between London and the West of England. Mr. W. A. Toppin, chief assistant engineer, presided at the social gathering at which the presentation was made. Mr. F. W. Billett, who made the presentation, said that while they were very glad that Mr. Acland was receiving a promotion, they were very sorry to part with him. Mr. Acland had held the scales between the workmen and the Corporation very well indeed. He did not think that in the last 17 years any of those who had served under Mr. Acland could say they had not had fair dealing and justice in every respect. On behalf of the staff he wished Mr. and Mrs. Acland success and prosperity, and what was better, health in their new sphere. Mr. Acland, in his reply, said that they had had a jolly time together and he took that opportunity of thanking them for the support they had always given to him. The position of a manager of departments like theirs was not a happy one in this respect; what he had to do was to try to satisfy the public. One could never do that, but one had to do one's best. Then he had to satisfy the committee, and he had always had the benefit of a good lot of people on the committees. One thing that had partly helped towards the success of the undertaking was that the committees put in a manager and they left him to manage, and dealt only with matters of policy. Another section he had to satisfy was the staff, and from the very flattering remarks of Mr. Billett, he thought he had been able to carry out that part of the work fairly well. With regard to the future of the undertakings which he had controlled for so long, it was highly probable that he would remain in touch with the work. Although his new headquarters would be in London, he would be in Chesterfield fairly often. It was probable that Mr. Toppin, his chief assistant, would carry on in his place, and he would like to ask the whole of the staff to give Mr. Toppin the same loyal support that they had always given to him. He was glad to say that during the whole time he had been associated with them they had never had the least cessation of work. Miss Robotham, a woman driver, whose plucky action in a tram smash a few days previously, probably averted a tragedy, was heartily applauded when she rose to present Mrs. Acland with a travelling bag,

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FINANCIAL.

Crompton & Co., Ltd.—An interim dividend at the rate of 7 per cent. per annum for the six months ended September 30th last has been declared.

Mexico Tramways and Power Group.—Mr. E. R. Peacock, the chairman of the committee for the protection of the holders of the securities of the Mexico Tramways, Light, and Power group of companies, is now in Canada for the purpose of discussing with the board of directors the affairs of the companies, and on his return the committee propose to issue a report on the general situation.

Provincial Tramways Co.—Presiding at the annual general meeting of the Provincial Tramways Company, the chairman, Mr. A. Beattie said that the past year was the best in the history of the company. They had been working under great difficulties and the cost of materials had increased considerably, while wages had also risen, but very satisfactory results had been obtained without an increase of fares.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Jan. 1 amounted to £69,720, an increase of £17,246 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to Jan. 1 (thirty-nine and a half weeks) the total receipts were £2,607,537, an increase of £420,565 on the corresponding period of 1917-18.

The English Electric Co.—The arrangements foreshadowed by the chairman at the annual meeting of Messrs. Dick, Kerr and Co., on December 19 last, have now been completed, and circulars have been issued to the shareholders giving full particulars of the scheme. A new company has been formed entitled The English Electric Company Ltd., of which particulars were given in our issue of Dec. 21. This company has acquired a controlling interest in the Coventry Ordnance Works, Ltd., and the Phœnix Dynamo Manufacturing Co., Ltd. An offer is made to the shareholders in Dick, Kerr and Company to exchange their shares, ordinary or preference, for an equal number of similar shares in the English Electric Company. Shareholders accepting will be given the right to subscribe at par for one ordinary share of £1 in the new company for every three shares (ordinary or preference) exchanged. The English Electric Company has a capital of £5,000,000 and the amalgamation of interests effected under it will form a complete organisation capable of undertaking contracts of the greatest magnitude. The board is a particularly strong one and representative of the leading engineering industries. Three large railway companies are represented by Sir Charles Ellis for the Great Eastern Railway, Mr. W. L. Hitchens for the London and North Western Railway, and Mr. B. A. Firth, for the Great Northern Railway, while Mr. John Sampson, a director of Messrs. Harland and Wolff, Ltd., and Sir Alexander Gracie, of the Fairfield Shipping and Engineering Company, represent ship building and owning interests. The joint managing directors are Lieut.-Col. J. H. Mansell, P. J. Pybus and W. Rutherford.

40-Hour Week at the Ford Motor Works.—Sir Percival Perry, managing director of the Ford Motor Company (England), Ltd., Trafford Park, was presented recently by the employees with an address of congratulation on his knighthood. In reply, he announced a reduction of working hours from 48 a week to 40, and such an alteration of minimum rates as to effect a rise in wages as from January 1st.

Motor Omnibuses Proposed for East Ham.—At a recent meeting of the East Ham Council there was a discussion on a proposal to introduce a service of motor omnibuses, which it was suggested should be run from the town to North Woolwich Ferry. Councillor Wiseman moved that a report with reference to the need of new tramway rolling stock should be referred back to the Tramways Committee, as some of the members desired that something should be done in regard to omnibuses as well as tramway cars. Councillor Ford observed that the time had arrived for the introduction of a service of motor omnibuses. Other councillors thought that there should be an increase in the service of tramway cars as well as a motor omnibus service. Eventually the matter was again referred to the Tramways Committee.

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TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

NAMES.	Week ended	Latest Return. 1917	Latest Return. 1918	Latest Return. Incr. or Dec.	Aggregate. Wks.	Aggregate. 1918	Aggregate. Incr. or Dec.
Aberdare U.D.C. ..	Dec. 24	536	593	+ 57	38	19,296	—
Aberdeen Corporation ..	„ 25	2,166	2,522	+ 356	30	78,138	+ 13,435
Ayr Corporation ..	„ 28	354	418	+ 64	32	20,502	+ 4,301
Birkenhead Corporation	„ 29	1,717	1,965	+ 248	39	85,746	+ 13,627
Blackburn „ ..	„ 25	1,694	1,864	+ 170	39¾	71,486	+ 12,666
Bradford Corporation ..	„ 28	7,405	9,090	+ 1,685	39	362,072	+ 61,267
Burnley Corporation ..	„ 28	2,054	2,690	+ 636	..	..	..
Burton-on-Trent Cor. ..	„ 29	346	430	+ 84	39	16,110	+ 3,778
Bury Corporation ..	„ 29	1,477	1,932	+ 455	39	79,958	+ 15,269
Chatham & District ..	„ 19	1,035	1,259	+ 224	51	64,770	+ 323
Cork Electric	„ 19	525	564	+ 39	51	30,909	+ 2,852
Derby Corporation ..	„ 28	1,045	1,470	+ 425	39	58,737	+ 11,136
Dundee City	„ 25	1,590	2,004	+ 414	52	62,037	+ 12,192
East Ham Corporation ..	„ 28	1,260	1,631	+ 371	38¾	61,018	+ 7,121
Glasgow Corporation ..	„ 28	26,830	28,470	+ 1,640	30½	863,917	+ 64,290
Glossop (U.E. Sup. Co.) ..	„ 28	180	210	+ 30	52	9,428	+ 1,314
Halifax Corporation ..	„ 24	2,398	3,019	+ 621	38¾	109,360	+ 13,909
do. Motor Buses ..	„ 24	56	70	+ 14	38¾	2,572	+ 679
Huddersfield Corporation	„ 28	3,251	4,430	+ 1,179	39	142,568	+ 18,881
Ilford U.D. Council ..	Oct. 12	713	1,000	+ 287	28	28,593	+ 6,779
Ipswich Corporation ..	Dec. 28	575	659	+ 84	39	29,609	+ 3,124
Isle of Thanet ..	„ 28	204	307	+ 103	12¾	3,966	+ 1,840
Kilmarnock Corporation	„ 28	222	292	+ 70	32¾	8,486	+ 1,931
Lanarkshire	„ 19	2,738	3,491	+ 753	51	180,915	+ 39,319
Leeds City	„ 28	11,535	14,894	+ 3,359	39	526,981	+ 96,458
Leicester Corporation ..	„ 28	3,935	4,791	+ 856	..	..	..
Leyton U.D. Council ..	„ 26	1,827	2,533	+ 706	39	92,015	+ 18,051
Liverpool Corporation ..	„ 28	15,861	19,259	+ 3,398	51¾	952,911	+ 141,079
Llandudno & Colwyn Bay	„ 20	222	286	+ 64	3	788	+ 129
London County Council ..	Jan. 1	52,474	69,720	+ 17,246	39½	2,607,537	+ 420,565
Maidstone Corporation ..	Dec. 26	263	297	+ 34	38¾	10,997	+ 1,452
Manchester Corporation	„ 28	20,283	23,313	+ 3,030	39	1,015,033	+ 202,997
Newcastle-on-Tyne Cor.	„ 28	7,149	7,840	+ 691	39	351,697	+ 45,685
Northampton Cor. ..	„ 27	912	1,008	+ 96	39	33,954	+ 1,056
Nottingham Corporation	„ 26	4,563	5,658	+ 1,095	39	222,768	+ 49,432
Oldham Corporation ..	„ 29	2,642	3,363	+ 721	40	138,884	+ 25,758
Reading Corporation ..	„ 26	1,038	1,194	+ 156	38¾	50,472	—
Rhondda Tramways ..	„ 19	1,544	2,003	+ 459	51	91,842	+ 15,136
Rotherham Corporation	„ 25	1,923	1,903	— 20	38¾	89,837	+ 19,742
Sheffield Corporation ..	„ 22	12,878	12,960	+ 82	38¾	520,112	+ 49,677
Southampton Cor. ..	„ 25	1,996	2,386	+ 389	38¾	98,541	+ 18,792
Southend-on-Sea Cor. ..	„ 25	663	1,140	+ 477	39	52,300	+ 16,613
South Shields Cor. ..	„ 21	997	1,108	+ 110	38	45,919	+ 7,719
Sunderland Corporation..	„ 28	1,858	2,321	+ 463	39	84,315	+ 12,285
Swindon Corporation .	Oct. 30	253	282	+ 29	30¾	9,428	+ 1,005
Torquay Tramways ..	Dec. 19	631	775	+ 145	51	45,682	+ 11,859
Tyneside Trys. & Trmrds.	„ 4	786	881	+ 95	23	23,358	+ 2,873
Wallasey Corporation ..	„ 28	1,404	1,759	+ 355	38¾	73,023	+ 10,993
Walsall Corporation ..	„ 28	1,159	1,457	+ 298	39	48,318	+ 9,496
Walthamstow U.D. Coun.	„ 28	1,119	1,475	+ 356	39	56,625	+ 8,587
Warrington Corporation	„ 12	678	814	+ 136	37	28,165	+ 7,418
West Ham Corporation	„ 26	3,471	5,068	+ 1,597	38¾	176,957	+ 34,394
Wigan Corporation ..	„ 19	2,106	2,605	+ 499	38	76,150	+ 15,309

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1916-17	Latest Return. 1917-18	Aggregate. Wks.	Aggregate. 1917-18	Aggregate. Increase or Dec.
Anglo-Argentine	Dec. 23	£54,902	£61,698	51	£2,867,279	+ £210,651
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Sept. 15	3,072	3,430	24	19,830	+ 1,208
Brazilian Traction (Mlrs.)	Oct.	8,006,000	8,052,000	43	85,782,000	+ 9,346,000
Brisbane	Nov.	32,901	39,246	47	401,878	+ 40,559
British Columbia .. $	Oct.	491,964	580,354	17	2,114,137	+ 271,661
Buenos Aires Lacroze ..	Nov.	39,678	42,952	21	208,764	+ 19,189
Burmah Tram. & Light Rs.	Nov.	27,760	34,407	17	141,946	+ 31,350
Calcutta .. .. Rs.	Dec. 21	69,569	84,177	51	31,185,206	+ 366,012
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Dec.	4,424	2,950	52	46,864	— 2,702
Cordoba	Aug.	14,233	15,734	21	79,054	+ 8,740
East India	Nov.	871	1,947	17	7,905	+ 2,731
Hong Kong.. .. $	Nov. 9	12,414	13,850	45	623,060	+ 13,048
Kalgoorlie	July	2,713	2,798	30	18,783	+ 629
La Plata	Oct.	3,742	5,334	47	56,826	+ 12,469
Lima	Sept.	35,636	42,861	39	389,668	+ 67,475
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	.
Madras (2 weeks) Rs.	Nov. 30	33,914	34,527	47	861,814	+ 96,252
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	— 83,959
Manila .. .. $	May	61,500	93,500	21	367,500	+ 100,060
Montevideo	Oct.	30,153	33,203	52	380,276	+ 20,444
Pernambuco	Dec. 22	4,769	5,235	51	224,745	+ 25,611
Peruvian .. .. $	Oct.	1,047,220	1,090,815	17	4,065,635	+ 113,245
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Nov.	5,358	6,611	47	65,804	+ 10,424
Shanghai .. .. $	May 29	24,611	24,708	21	523,298	+ 20,542
Singapore .. .. $	Nov. 2	12,517	13,385	44	611,062	+ 43,164
Toronto .. .. $	Oct.	1,043,886	1,048,478	43	10,645,075	+ 710,077
Winnipeg .. . $	Oct.	301,722	295,005	43	2,969,142	+ 235,626

WANTED.

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SATURDAY, JANUARY 11, 1919.

AGRICULTURAL LIGHT RAILWAYS.

THE Prime Minister during the recent general election campaign forcibly emphasised the importance of the development of light railways and of motor transport for the development of agricultural districts. A point still to be decided, and one on which strife will perhaps arise between advocates of different systems, is the relative spheres of light railways and of motor lorries and wagons. A wise and comprehensive examination of the subject by the promised Ministry of Transport will find suitable spheres of operation for both, so that one will be auxiliary to the other. The Ministry of Reconstruction are already considering the subject, and it is reported that they favour the development of an extensive system of light railways, which they suggest should be described as "agrails." A two-feet gauge is suggested, the lines to be laid for the most part on roads and road-side wastes, but partly on private land. A cheap form of construction is proposed, and passengers would, to a certain extent, be carried. The main purpose, however, is to transport goods for farmers and others. Either steam or electric traction is suggested, with petrol or horse haulage of wagons on the sidings leading into the farmers' yards. An experimental scheme is being worked out at Biggleswade. It is scarcely necessary to say that if any such scheme is to come to fruition, the procedure for acquiring powers and land must be very different from, and cheaper than, anything now existing. As to electric motive power, if the scheme for a national power supply comes into existence, the necessary energy should be available anywhere, but we shall probably have some time to wait for that. Steam meanwhile can be used where necessary. Such a system of railways would, undoubtedly, be of great benefit to the rural districts, but it need not be supposed that for some time at least there would be much return on the capital invested. It was shown in an elaborate report made to the Board of Trade by Lieut.-Col. Yorke, in 1912, that the average dividend on capital yielded by the elaborate system of light railways in Belgium was only 2·8 per cent. Some of the railways paid well and some paid nothing. This was over undertakings aggregating 3,000 miles in length. Capital was provided by the State by the provinces, and by the communes, and the lines were leased out. Some such comprehensive scheme would appear to be necessary in this country also, if agriculture is to benefit by the means suggested. From the point of view of the electrical industry, the scheme offers considerable prospects in light and medium electric traction work.

EMPLOYEES' NEW DEMANDS.

A meeting of representatives of the tramway companies connected with the Tramways and Light Railways Association was held on January 3, at Caxton Hall, to consider the demands put forward by the National Transport Workers' Federation, which were given in our issue of December 28. These demands include, among other concessions, a forty-four hour week for tramway employees. A committee was appointed to confer with the committee which it was expected would be appointed at the meeting to be held by representatives of the municipal tramways in Manchester on January 10. The joint committee it is anticipated will later confer with representatives of the National Transport Workers' Federation, with the object of arriving at some basis of agreement.

The employees' demands, if fully conceded, would be of course an exceedingly serious matter for tramway undertakings throughout the country, some of which are already in financial difficulties owing to the large concessions made to labour during the war. It is estimated that these demands, owing to the great additions to the number of employees necessary, would mean an average increase in working expenses of more than 25 per cent. In many towns the increase would be greater than this and the burden would be more than the industry could bear.

SERVICES DISORGANISED BY SNOW.

The first severe snowstorm of the winter took place on January 4, and in a number of Northern towns miles of telegraph and telephone wires fell from the weight of the snow. In many cases the tramway wires were also broken. In some places, owing to the clogging of the tramway points by the snow, the services were completely disorganised.

It is said that Manchester has not for many years suffered such intense discomfort. This was mainly owing to the absence of any reserve of labour that could be used in clearing the streets. Rain fell heavily in the first hours of Saturday morning and snow began to fall about 3 o'clock. A few hours later the streets were deeply buried in snow, which continued to fall until the afternoon. The sprinkling of salt was the only effective measure which could be taken by the cleansing authority up to that time. Trolley wires fell in many places and the current had to be shut off, thus causing great disturbance in the service. For some time the snow fell as quickly as it could be removed, but eventually snow ploughs and salt cleared the lines sufficiently to enable some cars to run. The trouble was accentuated by the clogging of points and there were frequent derailments at junctions.

At Sheffield the fall was one of the heaviest experienced for several years. Trolley wires were broken and many of the roads were impassable, the tramway and omnibus services being greatly interfered with. The Highways Department experienced great difficulty in snow clearance, as there was a shortage of men and of horses. The shortage of horses was to some extent met by the use of steam lorries, which were able to remove heavy loads. The ploughs of the tramways department were set to work about 4 o'clock, but it was nearly 10 before anything like a good service could be run.

At Bath the service was generally disorganised. Snow brushes were put to work in the evening, but the running of the cars was greatly impeded. Much difficulty was caused by the falling of telephone wires across the tramway wires. The system was, however, in working order by 10 o'clock the following morning.

Changes Due to 47-Hour Week.—Owing to the introduction of a forty-seven hour week in the engineering trades, it has been necessary to alter the starting times on various tramways, in order to conform to the new hours of work. Very short notice of the altered times was received, but the tramway managers made the best arrangements they could in the interval to deal with the workmen's traffic. At Newcastle, for instance, the service of workmen's cars was commenced one and a half hours later.

Increased Wages at Keighley.—Keighley Tramways Committee reported at the last meeting of the Council that the award of the Committee on Production dated November 21 would increase the drivers' wages from £2 16s. 11d. to £3 1s. 11d., and of the conductors to £2 4s. This would entail a further expenditure of £650 a year, and the Committee recommended the Council to endorse an increase of fares to a charge of one penny per mile, in order to meet the increased cost. It was intimated that a large expenditure was also required on the permanent way.

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TRANSPORT IN RURAL DISTRICTS.

SUGGESTIONS BY THE MINISTRY OF RECONSTRUCTION.

The Ministry of Reconstruction have recently presented a detailed report to the Government on the subject of transport in rural localities. In February of last year Dr. Addison sent to the county councils and other local bodies a letter inviting their views on reconstruction questions generally. A large proportion of the replies suggested, among other things, an improvement in rural transport, and particularly in the means of inter-communication between villages and the places at present served by railways.

After a careful consideration of various methods of meeting the demand, the Department favours the development of an extensive system of light railways, which, because they will be directed primarily to the promotion of agriculture, it is proposed to call "Agrails." The form of transport contemplated is neither a light railway nor a tramway in the ordinary meaning of these terms. The track would be a kind of tramway, cheaply constructed and easily laid and lifted, of 2 ft. gauge. It would be laid on the road, or, where the road was not sufficiently wide, over ditches or waste land alongside the road. A single track would be used, with loops at frequent intervals, and fencing and signals would be reduced to a minimum. Though the gauge would be narrow, the trucks might have a considerable overlap, and, though it would be inadvisable, for the sake of the light track, to run such heavy loads, there is stated to be no reason why the trucks should not have the same capacity as standard gauge wagons. Passenger cars of some type still to be settled—possibly of the toast-rack pattern—would be run; but the primary purpose of the "agrails" would be the carriage of agricultural supplies and produce, coal, road materials, etc., and it is doubtful whether the passenger service would be either frequent or punctual. The speed would not be very high; the motor traffic limit of 20 miles an hour is suggested.

The traction would be mainly by steam or electricity, according to local conditions, and where the rails were carried into sidings on private farms, petrol tractors or horses would draw the wagons. Possibly by the use of containers, it would be feasible to run loads direct from the "agrails" to the ordinary railways with which they would be joined, while another possibility is the invention of a device whereby a wagon might serve both for road transport and for "agrail" journeys.

No great difficulty is anticipated in connection either with materials or with land. There is much light railway material lying in France and elsewhere, and, even assuming that the equipment in France is taken over by the French Government, the plant for making the material and the habit of making it have been fully acquired by manufacturers in this country. As to land, it is assumed that both in the process of acquisition and in the method of valuation the general principles laid down by the Committee of which Mr. Leslie Scott was Chairman would be followed. As the "agrails" would be laid mainly on the roads, the amount of land to be acquired would not be large.

The function of the Ministry of Reconstruction in this matter is advisory, and the carrying out of their plans or any others which may be accepted by the Government and authorised by Parliament would probably be entrusted to the Ministry of Transport, which has yet to be created.

An experimental light railway scheme is being worked out at Biggleswade by the Board of Agriculture. Military material which was lying there is being used, and it is hoped that the experiment will demonstrate that the saving in the cost of road upkeep by the withdrawal of heavy market traffic will more than cover the interest on the local authorities' share of the capital expenditure.

MISCELLANEOUS NEWS AND NOTES.

Cars Required for Wallasey.—Wallasey Tramways Committee is inviting tenders for the supply of electric tramway cars and motor omnibuses. Particulars will be found in our advertisement columns.

Lincoln Surface Contact Tramways.—Owing to the burning out of an underground cable on the Lincoln Corporation tramways, the studs were electrified for some distance and a horse was killed.

Collision in the Fog.—The tramway service at Rhondda was disorganised for some hours on January 4 owing to fog. Two cars collided and the driver of one and several passengers were injured.

Dropped Gear Case.—The derailment of a Cardiff car on January 3 was due to the dropping of a gear case, a very unusual cause. Within a few minutes the car was placed on the rails and taken to the depot.

Northampton Tramways Committee, after reinstating all employees returning from war service, propose to fill all vacancies by giving preference to temporary employees with the longest service and the best record for efficiency.

New Cars for Lincoln.—The Town Council proposes to ask the Local Government Board for sanction to borrow £6,000 for the purchase of three tramway cars. The engineer has been instructed to report on the conversion of the tramways from surface contact to overhead trolley system.

Proposed Extensions at Maidstone.—Maidstone Corporation propose shortly to give consideration to plans for extending the tramways in the borough in the direction of North Ward, and for construction of a line communicating with Chatham. It is estimated that the cost of the proposed extensions is £100,000.

London Labour Programme.—The programme of the London Labour Party for the coming County Council election includes ownership by the Council of motor omnibuses, taxi-cabs, railways, etc.

Proposed Extension at Dewsbury.—The National Electric Construction Co., Ltd., have informed Dewsbury Corporation that they are prepared to enter into an agreement for the construction of tramways to Shawcross, but the Council have deferred reconsideration of the matter.

Lancashire and Yorkshire Strike.—The employees of the Formby power station, who had been on strike for a week, resumed work on Tuesday morning, pending the settlement of their grievance through the National Union of Railwaymen. Unless a satisfactory adjustment is reached on Saturday, they threaten to cease work again.

Westinghouse Reunion Dinner.—Ex-Westinghouse men will hold their first reunion dinner at the Connaught Rooms, London, on February 14. Any ex-Westinghouse men who have not received an invitation are asked to communicate with Mr. L. S. Richardson, 14, Sydney Road, Richmond, Surrey, who will be pleased to furnish particulars.

Fine for Disfiguring a Car.—A youth was fined 5s. damages and costs at Rhondda recently for disfiguring a tramway car by striking a match on it. For the company it was stated that they were put to much inconvenience by such conduct on the part of boys. The defendant was prevented from striking a match on the platform, but in alighting struck a match on the side, causing a scratch seven inches long.

Through Running between Pontypridd and Rhondda.—The Board of Trade having held that a case has been made out for through running between Pontypridd and Rhondda, an agreement for this purpose has been made between the Rhondda Tramways Company and the Pontypridd Council. The first car was run for experimental purposes on the afternoon of January 2, and proved that the Pontypridd tracks are suitable for the Rhondda cars.

Strike at Grimsby.—On January 3 the engineers at the power station struck in consequence of the refusal of the employers to accede to their demand in regard to working hours. Current was cut off and the lighting and tramway services were discontinued. Help was obtained from the naval authorities, and men from the minesweepers were sent to the assistance of the station. The electric supply was partially restored by 11 p.m.

Proposed Extensions at South Shields.—Several proposed extensions of the tramways, which had been deferred owing to the war, have now been considered by a Sub-Committee of the Corporation. Specifications and conditions for carrying out the work have been prepared and the town clerk has been instructed to apply for sanction to exercise the borrowing powers which the Corporation obtained under their Act of 1915.

Belfast Permanent Way.—At the last meeting of the Belfast Tramways Committee the general manager (Mr. J. S. D. Moffat) submitted a report upon the staff he would require in connection with the permanent way upkeep, which, under the reorganisation scheme, has been taken over by him. It was decided to recommend the Council to authorise the Committee to appoint an assistant permanent way engineer to be responsible to the general manager for the general maintenance and upkeep of the track.

Penny Stage Retained at York.—York Council have decided to retain the penny stage. Councillor Horsman, in making the proposal, said that while the receipts showed an increase of £200 per week, less passengers were carried. Alderman Inglis, who seconded, said that while many people would not bother about spending a penny, they would consider a fare of three halfpence a waste of money. It was easy to devise a scheme under which the penny fare could be retained.

Shortage of Drivers at Nottingham.—Mr. R. H. Swain, Chairman of the Tramways Committee, at a meeting of Nottingham City Council, explained that there were difficulties in the service owing to the shortage of drivers and conductors. Many were on the sick list and about fifty per cent. of the staff were still in the Army. Until these men returned very little alteration could be made in the service. Owing to the shortage of men in the repair shops, there were difficulties in the repair of the cars, while the wear and tear of the rolling stock was greater owing to the bad state of the track.

Threatened Strike in the Underground Power Station.—The Railway Executive Committee having declined to accede to a demand for a 47-hour week, the electrical engineers employed at the Chelsea power station, threatened to strike on Thursday. This would have entailed a complete stoppage of all traffic on the District and the Tube Railways with the exception of the Central London Railway. The men, who number between five and six hundred, proposed to stop work and so cut off the current if their demand was not acceded to by 5 o'clock. Officials of the Electrical Trades Union intervened, however, with the result that a meeting was arranged between the Union and the Railway Executive Committee. A Conference will be held early next week and pending a decision the men are continuing at work.

Christmas Day Strike at Wallasey.—At the meeting of the Wallasey Town Council the action of the tramway employees in going on strike on Christmas Day was vigorously criticised. Mr. Howse, Chairman of the Tramways Committee, in reply to questions, said that the manager was informed beforehand of the intended refusal to work, and also that if the cars were brought out on Christmas Day the staff would not work on Boxing Day. The employees were then asked to work in relays, and everything was done to try to meet

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their wishes. The employees' union was to blame for the cars not being run. Mr. Howse said that something should be done to prevent the district being left without a tramway service in that way again, and he thought they would be justified in stopping the whole year's bonus. There was no objection to the workers being members of a union, but they ought not to have special privileges. Alderman Farley said the whole thing was most lamentable. Soldiers on leave, who had travelled four or five days, arrived at Seacombe Ferry and found no vehicles to carry them and their heavy kits to their homes. Elderly people, not knowing of any stoppage, also landed at the ferry. He felt that public servants who had accepted certain conditions of service should not allow themselves to be overruled by union officials. It was time the ratepayers took matters into their own hands. The sooner such an organisation was smashed the better. The Committee agreed that their employees should have the best conditions as to wages and hours, but they expected them to act in a reasonable way. Mr. Rymer, as a trade unionist, thought the Christmas Day strike was a mistake in tactics from a trade union point of view. The Tramways Committee should have taken more drastic steps, and should have asked the volunteer motor drivers to turn out and carry the people. Mr. Griffin remarked that the position of the Committee was weakened by the fact that a number of municipalities had previously decided not to run the cars.

PERSONAL.

Mr. R. O. Baldwin, general manager of Exeter Corporation tramways, has been granted an increase of £50 in salary.

Mr. Toppin, assistant electrical engineer of Chesterfield Corporation, succeeds Mr. Acland in charge of the electricity and tramways departments.

Mr. R. L. Acland, who recently resigned the position of borough electrical engineer and tramways manager of Chesterfield, has been retained by the Corporation as consulting engineer, at a salary of £100 per annum.

Mr. J. H. Rider has been retained to advise the combination of Nottingham, Derby, Leicester, Mansfield and other Midland towns on the question of electric power supply. Mr. Rider is taking the place of Sir John Snell, who has accepted a Government appointment.

Mr. George Webster, manager of Rochdale Corporation tramways, has received the Order of the British Empire as a recognition of work done in connection with the war. Mr. Webster for two years acted as honorary secretary of the Rochdale Shell Factory, which carried on work at the tramway sheds in Mellor Street. He was afterwards elected a member of the board of directors.

Mr. H. Vernon has been appointed rolling stock and overhead equipment engineer of Belfast Corporation Tramways, in succession to Mr. A. A. Blackburn, who took over the managership of the Huddersfield sytem on January 1. Mr. Vernon has been superintendent of the tramways engineering works since the electrification of the system fourteen years ago. The appointment is subject to confirmation by the Council at its next meeting.

Private W. Lonsdale, who before he joined the Army was a car conductor in Leeds, and who for a long time was a prisoner of war in Germany, has now returned home and has given a graphic narrative of his experiences. He was twice condemned to death and twice sentenced to long terms of imprisonment. He has stated that he desires as soon as possible to return to his old employment.

Mr. J. F. Cameron.—Owing to the shortage of staff at the power station and the increasing difficulties which have arisen during the war, a large amount of extra work has been thrown upon Mr. J. F. Cameron, engineer and general manager of Northampton Corporation tramways. While influenza was rampant he was obliged temporarily to act as stoker. The Tramways Committee have recommended that Mr. Cameron be granted an honorarium of £100 in recognition of the valuable services he has rendered under exceptionally onerous conditions.

Mr. W. E. Hammond, late traffic manager of the Metropolitan Electric Tramways, Ltd., has received a presentation from the staff as a token of their good will and esteem. The presentation, which took the form of a silver and tortoiseshell brush set, electro-plate, oak and cut-glass tantalus frame and a silver salver, was made by Mr. C. J. Spencer, general manager of the tramways of the London Traffic Group, at the Manor House offices, in the presence of a large gathering on December 23. Mr. J. McLeod, chief accountant, was in the chair. Officers representing other departments spoke of Mr. Hammond's long connection with the tramway industry, and Mr. Hammond suitably replied.

A Brave Woman Driver.—Miss Robotham, a driver on Chesterfield Tramways, has been presented with a cheque for £2 by the Tramways Committee and an insurance coupon in recognition of her courageous conduct. Alderman Rhodes, in making the presentation, said that Miss Robotham recognising that a collision was unavoidable, knocked on one side the learner, who was driving, and applied the brakes. The car was pulled up before another car dashed into it. The Tramways Committee, he said, commended her on her conduct, her presence of mind, and her nerve, for she undoubtedly prevented what otherwise would have been a very serious, if not a tragic, accident. As a member of the Tramways Committee and as a frequent user of the cars, he wished to take that opportunity of saying that the girls, as drivers and conductresses, had discharged their duties most satisfactorily. He looked forward with regret to the time when the cars would be driven once again by mere men.

The death of **Mr. Walter Calver,** traffic superintendent of Reading Corporation tramways, took place last week. He had been ill for some time. Mr. Calver was associated with the Norwich Electric Tramway Company for some years, subsequently going to Bournemouth, and thence to Reading.

The Late Mr. Stephen Sellon.—At the meeting on January 6 of the Executive Council of the Tramways and Light Railways Association, Mr. Howley, in the unavoidable absence of Sir Arthur Stanley, moved a resolution expressing the sympathy of the Association with the relatives of Mr. Stephen Sellon, who was one of the founders of the Association and a prominent and valued member. Mr. T. B. Goodyer seconded the resolution, which was agreed to by the members silently upstanding.

FINANCIAL.

London United Tramways.—Meetings of preference shareholders and debenture stock holders are to be held on January 23 to consider a scheme of rearrangement.

Holiday Traffic at Southend.—Southend Corporation Tramways for the week ended January 1, 1919, report an increase of £676 9s. 8d. in receipts. This is more than double those of a year ago, when the receipts were £619 5s. 4d. For forty weeks the increase in receipts aggregates £17,289.

Blackpool, St. Anne's and Lytham Tramways Co.—During the past year this undertaking carried over eight million passengers. The receipts were £63,620 and the available balance was £10,347. Debenture interest requires £7,500 and £1,500 is carried to the sinking fund. There is an adverse balance of £39,084.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Jan. 8 amounted to £71,013 an increase of £20,542 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to January 8 (forty and a half weeks) the total receipts were £2,678,554, an increase of £441,111 on the corresponding period of 1918.

Glasgow Tramway Service.—To cope with the extra traffic on the Glasgow Corporation tramways during the New Year holidays there was a great increase in the number of cars. This is indicated by the car miles run last week, the total being 576,883, which was 85,146 miles more than in the preceding week and 8,686 more than in the corresponding week 12 months ago. The passengers numbered, 9,089,492, an increase of 535,071; while the receipts were £31,100 as against £29,947. From the beginning of the current financial year on June 1, 1918, the receipts have been £895,016, compared with £829,981 in the corresponding period of the preceding year; while the passengers have numbered 271,686,846, as against 253,392,513.

MUNICIPAL COMMISSIONERS, GEORGE TOWN, PENANG.

Mains Superintendent.

The Municipal Commissioners, George Town, Penang, require a Mains Superintendent for their Electric Light and Tramway Department.

Must have had a good technical and practical electrical training, with thorough knowledge of the design, construction and maintenance of 3-wire direct current cable systems. The cables in Penang are mainly Callender's lead-covered laid solid underground. First engagement for three years. Salary 250 dollars per month, rising 20 dollars per month annually to 450 dollars per month, with duty allowance of 60 dollars. Sterling value of commencing salary, say, £425 per annum while in Penang. Free passage out and home again on satisfactory termination of engagement. Strict medical examination required.

Application, in writing only, giving full experience, with copies of not more than three recent testimonials, and with three names of references as to personal character, to be sent to the Consulting Engineers to the Municipal Commissioners, Messrs. PREECE, CARDEW, SNELL & RIDER, 8, Queen Anne's Gate, S.W.1, on or before Thursday, January 23rd, 1919.

DICK, KERR & Co.,
Limited,
ABCHURCH YARD, CANNON STREET
LONDON, E.C.,
ENGINEERS & CONTRACTORS.

Complete Equipment
TRAMWAYS & LIGHT RAILWAYS
at home and abroad

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PRICE LIST OF TRAMWAY AND OMNIBUS SHARES.

Dividends Prev.	Dividends Last.	Name.	Paid.	Price, July 27, 1914.	Cash Jan. 9 or previous.	A Week Ago.
5%	5%	Alabama Traction 5% 1st Mt. ..	—	67	68¾	69
2/9	2/9	Anglo-Argentine 5½% 1st Pref.	5	4¾	78/1½	78/9
2/9	2/9	Do. 5½% Cum. 2nd Pref. ..	5	4¾	73/9	73/1½
4%	4%	Do. 4% Deb.	100	91	70¼	72¼
4½%	4½%	Do. 4½% Deb.	100	98½	72¼	72¼
5%	5%	Do. 5% Deb.	100	96	74	74½
—	—	Associated Omnibus Co., Ord. ..	5/-	3/32	1/2	1/2
6d.	1/-	Auckland Elec. Trams. Ord. ..	1	1 3/32	19/3	22/-
5%	5%	Do. 5% 1st Mt. Deb. ..	100	102½	89¾	89¾
7%	7%	Barcelona Trac. 7% Pr. Lien ..	100	—	107½	107½
—	1/-	Bath Electric Trams Pref. Ord.	1	¼	3/5	3/5
6d.	6d.	Do. 5% Cum. Pref. ..	1	5/16	10/-	10/3¾
4½%	4½%	Do. 4½% 1st. Mort. Deb. ..	100	72½	68	68
4½%	4½%	Birmingham Dist. Pwr. and Tract. Co. 4½% 1st Deb. ..	100	84½	73½	73½
28/-*	14/-*	Bombay Elec. Sup. & Tram Ord.	10	14	23 1/16	23 1/16
6/-	6/-	Do. 6% Cum. Pref. ..	10	11¾	10 15/16	10 15/16
4½%	4½%	Do. 4½% Deb.	100	96	75½	76½
5%	5%	Do. 5% 2nd Mt. Deb. ..	100	100	89	89
$1	$1	Brazilian Trac. & Power Ord. ..	$100	66	57	57 7/16
$1½	$1½	Do. 6% Cum. Pref. ..	$100	97	92½	92½
4/-	4/-	Brisbane Elec. Trams. Ord. ..	5	7½	5½	5½
2/6	2/6	Do. 5% Cum. Pref. ..	5	5	82/6	82/6
4½%	4½%	Do. 4½% 1st Deb. ..	100	101½	93	93
8%	8%	Brit. Col. Elec. Ry. Def. Ord. ..	100	107	44	45
6%	5%	Do. Pref. Ord.	100	106	49	49
5%	5%	Do. 5% Cum. Pref. ..	100	103	66	66
4½%	4½%	Do. 4½% 1st Mt. Debs. ..	40	99½	82½	82½
4½%	4½%	Do. 4½% Perp. Con. Deb.	100	96½	61½	61½
£3*	£3*	Brit. Elec. Trac. Ord.	100	—	47½	46½
6%	6%	Do. 6% Cum. Part. Pref.	100	—	79	78
5%	5%	Do. 5% Deb.	100	92	84½	84½
4½%	4½%	Do. 4½% 2nd Deb. ..	100	77½	67	67
5%	5%	B. A. Lacroze 5% Mt. Deb. ..	100	100	74	75½
5/6	2/6	Calcutta Tramways Ord. ..	5	7½	7⅝	7 5/16
2/6	2/6	Do. 5% Cum. Pref. ..	5	5 1/16	78/9	80/-
4½%	4½%	Do. 4½% 1st Deb. ..	100	99½	72	72
1/-*	1/-*	Cape Elec. Trams.	1	13/16	15/6	15/6
1/3	1/3	City of B. A. Trams	5	5½	82/6	83/1½
4%	4%	Do. 4% Deb.	100	97½	71¼	71¼
5%	5%	Colombo Elec. Tram. & Ltg. Co. 5% 1st Mort. Deb.	100	95	80	80
5%	5%	Co. F.C. do. Jardin Botanico 5% 1st Mort. Bds.	100	93½	81¾	81¾
5%	5%	Costa Rica Elec. Lt. & Trac. Co. 5% 1st Deb.	—	63½	57½	57½
5/-	4/-	Dublin United Trams. Ord. ..	10	8	8 3/16	8¼
6/-	6/-	Do. 6% Pref.	10	12	10½	10¾
—	—	Hastings & Dis. Elec. Tram Ord.	10/-	7/16	1/6½	1/6½
1/2½*	1/2½*	Do. 6% Cum. Pref. ..	1	9/16	10/9	10/9
4½%	4½%	Do. 4% Deb.	100	67½	52½	52½
8½d.	7d.	Hong Kong Tramway	5/-	9/16	23/3	23/3
5%	5%	Do. 5% Deb.	100	87½	98½	98½
2/6	3/-	Isle of Thanet 5% Pref. .	5	2¼	22/9	22/9
4%	4%	Do. 4% Deb.	100	73½	—	—
5%	5%	Kalgoorlie Trams 5% A. Deb. ..	100	84½	—	—
—	—	La Plata Trams. Ord.	1	⅛	2/6	2/6
9/6	7/-	Lanarkshire Trams Co. ..	10	10½	10⅝	10⅝
5%	5%	Lancs. Un. Trams 5% Pr. Ln.	100	85½	69	69
5%	5%	Lisbon Elec. Trams 5% Mt. Debs.	100	95	71	71
9½d.*	7½d.*	Llandudno & Colwyn B. Ord.	1	—	9/6	9/6
—	1½d.	London & Sub. Traction Ord. ..	1	13/32	3/10	3/6
6d.	6d.	Do. 5% Pref.	1	5/16	8/2½	8/4½
4½%	4½%	Do. 4½% 1 Mt. Deb. ..	100	75½	59½	61
4½%	4½%	L.G.O. 4½% 1st Deb.	100	100	80½	83
5%	5%	Do. 5% Inc. Deb... ..	100	88½	76	78
4%	4%	Lon. Unt. Trams. 4% 1st Mt. Db.	100	55	42½	42½
3/-	3/-	Madras Elec. 6% Pref. ..	5	5 1/16	83/9	83/9
5%	5%	Do. 5% Deb.	100	100	84½	84½
7½d.%*	9½d.*	Manaos Trams & Ltg. Ord. ..	1	9/32	5/9	5/9
5%	5%	Do. 5% 1st Deb.	100	77	67½	67½
$1½	$1½	Manila Elec. R. R. & Light ..	$100	102	90	90
4½%	4½%	Met. Elec. Trams. 4½% Deb. ..	100	85½	69	68
5%	5%	Do. 5% Deb.	100	87	78	78
$1½	$1½	Mexico Trams. Common ..	$100	70	45½	45
5%	5%	Do. 1 Mt. 5% G.B. ..	—	84	67	67
—	—	Do. 6% Mt. Bds.	100	76	51½	52
4½%	4½%	Montreal St. Ry. 4½% Stg. Dbs...	100	100	96½	94
5½%	4½%	Do. 4½% Stg. Debs. (1922)	100	99	91½	91½
2%	5%	Montreal Trams. Co. 5% Gld. Bd.	—	103	—	—
2/-	1/2½*	National Steam Car	1	1/32	15/-	15/-
9½d.*	9½d.*	New General Traction	1	⅛	7/3	7/3
8½d.	6d.	Northern Gen. Trans. Ord. ..	1	3/16	13/7½	13/7½
4/-	3/-	Para Elec. Rlys. Ord.	5	4¼	5 1/16	5⅛
5%	5%	Do. 5% 1st Deb.	100	89½	81	81
—	—	Pernambuco Tram. & Power Ord	1	—	8/3	8/3
—	8½d.	Do. 7% Non. Cm. Part Pf.	1	—	16/6	16/6
5%	5%	Portland Ry. 5% 1st Mt. 30 yr.	—	96	—	—
8½d.*	8½d.*	Potteries Elec. Trac. Ord. ..	1	11/32	8/9	9/4½
6d.	6d.	Do. 5% Pref.	1	15/32	11/9	11/9
2d.	1/4	Provincial Trams. Ord. ..	1	⅜	19/1½xd	19/1½xd
3/-	3/-	Rangoon Tram. 6% Cum. Pref.	5	5¼	75/-	85/-
5%	5%	Rhondda Trams. 5% 1 M. Deb.	100	88	77¾	77¾
5%	5%	Rio de Janeiro Try. & Pr. 1st Mt. 30 yr. 5% Gld. Bd. '35 ..	—	97½	89½	92½
5%	5%	Do. 1st Mt. 5% 50 yr. ..	100	89½	81½	82½
5%	5%	Sao Paulo Deb. 5% 1st Mt. ..	$500	99	89½	89½
5%	5%	Do. 5% Perp. Deb. ..	100	99½	79½	80
15/-	10/-	Shanghai Elec. Cons.	10	13	14 13/16	14 13/16
3d.	3d.	Singapore Elec. Trams. ..	5/-	¼	5/-	5/-
4%	4%	Sou. Met. Elec. Tram & Ltg. 4% Db	100	66	51	51
5%	5%	S. Elec. Trams. of B.A. 5% Mt. ..	—	100½	97¾	97¾
4½%	4½%	Toronto 1st Mt. 4½% Bds. ..	100	98	94½	94½
4½%	4½%	Tramways (M.E.T.) Omnibus 4½% Debs.	100	91	75	75
2/-	2/-	Un'd. El. Tr. Monte Video Ord.	5	4½	47/6	52/6
4½%	4½%	Winnipeg El. 4½% Deb. ..	100	94½	69	70½
—	—	Yorks (W.R.) Elec. Trams. Ord.	5	½	24/	24/-
3/-	3/-	Do. 6% Cum. Pref. ..	5	½	81/3	81/3
4½%	4½%	Do. 4½% 1st Deb.	100	85½	73	73
—	—	Metropolitan Dist. Ord. ..	100	21¾	26	25½
—	—	Undgd. Elec. Rys. of London ..	10	21½	71/3	66/3
		Do. "A"	1/-	½	9/0¾	8/3
4½%	4½%	Do. 4½% Bds. of 1933 Rd.	—	99	103	104¾
6%	6%	Do. 6% 1st. Cum. In. Db.	100	114	100½	101½
4%	4%	Do. 6% In. Bonds Rd. ..	—	88	94	93½

*Indicates dividend for the year. In other cases the dividend is for the half-year.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

Names.	Week ended	Latest Return. 1917	1918	Incr. or Dec.	Aggregate. Wks.	1918	Incr. or Dec.
Aberdare U.D.C. ..	Dec. 31	507	615	+ 108	39	19,911	—
Aberdeen Corporation ..	Jan. 1	2,496	2,775	+ 279	31	80,913	+ 13,714
Ayr Corporation ..	" 4	430	507	+ 76	33	21,009	+ 4,378
Birkenhead Corporation	" 5	1,812	2,138	+ 326	40	87,884	+ 13,953
Blackburn " ..	Dec. 25	1,694	1,864	+ 170	39¾	71,486	+ 12,866
Bradford Corporation ..	Jan. 4	7,812	8,710	+ 898	40	370,762	+ 62,165
Burnley Corporation ..	" 4	1,995	2,268	+ 273	..	..	..
Burton-on-Trent Cor. ..	" 5	345	441	+ 96	40	16,550	+ 3,874
Bury Corporation ..	" 5	1,698	2,119	+ 411	40	82,076	+ 15,690
Chatham & District ..	Dec. 26	1,138	1,150	+ 17	52	65,920	+ 340
Cork Electric	" 26	609	600	— 9	52	31,510	+ 2,844
Derby Corporation ..	Jan. 4	1,276	1,487	+ 211	40	60,224	+ 11,347
Dundee City	" 1	1,820	2,167	+ 347	53	64,205	+ 12,540
East Ham Corporation ..	" 4	1,197	1,689	+ 492	39¾	62,708	+ 7,612
Glasgow Corporation ..	" 4	29,947	31,100	+ 1,153	31½	895,017	+ 65,035
Glossop (U.E. Sup. Co.) ..	" 4	184	182	— 2	1	182	— 2
Halifax Corporation ..	Dec. 31	2,570	2,931	+ 361	39¾	112,291	+ 14,270
do. Motor Buses ..	" 31	58	76	+ 18	39¾	2,648	+ 697
Huddersfield Corporation	" 28	3,251	4,430	+ 1,179	39	142,568	+ 18,881
Ilford U.D. Council ..	Oct. 12	713	1,000	+ 287	28	28,593	+ 6,779
Ipswich Corporation ..	Jan. 4	558	715	+ 157	39	30,325	+ 3,291
Isle of Thanet ..	" 4	164	371	+ 207	13¾	4,337	+ 2,047
Kilmarnock Corporation	" 5	315	403	+ 88	33¾	8,890	+ 2,020
Lanarkshire	Dec. 26	2,859	3,474	+ 615	52	184,390	+ 39,935
Leeds City	Jan. 4	10,866	13,397	+ 2,531	40	540,320	+ 99,256
Leicester Corporation .	" 4	3,985	4,970	+ 985	..	..	..
Leyton U.D. Council .	" 2	1,721	2,629	+ 908	40	94,644	+ 18,959
Liverpool Corporation ..	" 4	16,291	20,060	+ 3,769	..	..	..
Llandudno & Colwyn Bay	Dec. 27	270	361	+ 91	4	1,149	+ 220
London County Council ..	Jan. 8	50,471	71,013	+ 20,542	40	2,678,554	+ 441,111
Maidstone Corporation .	" 2	288	363	+ 75	39¾	11,361	+ 1,527
Manchester Corporation	" 4	22,445	25,515	+ 3,070	40	1,040,545	+ 206,195
Newcastle-on-Tyne Cor.	" 4	8,149	8,133	— 16	40	359,830	+ 45,703
Northampton Cor. ..	" 3	861	1,069	+ 208	40	35,022	+ 1,264
Nottingham Corporation	" 2	4,602	5,861	+ 1,259	40	228,729	+ 50,791
Oldham Corporation ..	" 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation ..	" 2	1,049	1,248	+ 199	39¾	51,721	—
Rhondda Tramways ..	Dec. 19	1,544	2,003	+ 459	51	91,842	+ 15,136
Rotherham Corporation	Jan. 8	1,854	1,858	+ 4	40¾	94,091	+ 20,399
Sheffield Corporation ..	Dec. 29	11,100	11,551	+ 451	39¾	531,663	+ 50,127
Southampton Cor. ..	Jan. 1	2,113	2,385	+ 272	39¾	100,927	+ 19,064
Southend-on-Sea Cor. ..	" 1	619	1,295	+ 676	40	53,596	+ 17,290
South Shields Cor. ..	Dec. 21	997	1,108	+ 110	38	45,919	+ 7,719
Sunderland Corporation.	Jan. 4	2,056	2,559	+ 503	40	86,873	+ 12,787
Swindon Corporation .	Oct. 30	253	282	+ 29	30¾	9,428	+ 1,005
Torquay Tramways .	Dec. 19	631	775	+ 145	51	45,682	+ 11,859
Tyneside Trys. & Trmrds	" 4	786	881	+ 95	23	23,358	+ 2,873
Wallasey Corporation .	" 4	1,476	2,005	+ 529	39¾	75,027	+ 11,521
Walsall Corporation ..	" 4	1,027	1,312	+ 285	40	49,630	+ 9,775
Walthamstow U.D. Coun.	Jan. 4	1,079	1,467	+ 388	40	58,092	+ 8,994
Warrington Corporation	Dec. 12	678	814	+ 136	37	28,165	+ 7,418
West Ham Corporation	Jan. 2	3,412	4,892	+ 1,480	39¾	181,849	+ 35,874
Wigan Corporation .	" 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

Name.	Week or Month.	Latest Return. 1916-17	1917-18	Aggregate. Wks.	1917-18	Increase or Dec.
Anglo-Argentine	Dec. 31	£63,998	£68,664	52	£2,935,943	+ £215,317
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,882
Ballarat and Bendigo (4 wks)	Oct. 13	3,546	3,690	28	23,520	+ 1,347
Brazilian Traction (Mlrs.)	Oct.	8,006,000	8,052,000	43	85,782,000	+ 9,346,000
Brisbane	Nov.	32,901	39,246	47	401,878	+ 40,559
British Columbia .. $	Nov.	525,629	612,893	21	2,727,030	+ 358,925
Buenos Aires Lacroze ..	Dec.	40,901	50,460	26	259,224	+ 28,748
Burmah Tram. & Light Rs.	Nov.	27,760	34,407	17	141,946	+ 31,350
Calcutta .. .. Rs.	Dec. 21	69,569	84,177	51	31,185,206	+ 366,012
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Dec.	4,424	2,950	52	46,864	— 2,702
Cordoba	Aug.	14,233	15,734	21	79,054	+ 8,740
East India	Dec.	1,099	2,048	21	9,953	+ 3,680
Hong Kong .. .. $	Nov. 16	12,308	14,028	46	637,088	+ 14,768
Kalgoorlie	Aug.	2,911	3,340	34	22,123	+ 1,058
La Plata	Oct.	3,742	5,334	47	56,826	- 12,469
Lima	Sept.	35,636	42,861	39	389,668	+ 67,475
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Dec. 31	46,646	43,146	52	942,232	+ 94,912
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	— 83,959
Manila .. .. $	May	61,500	93,500	21	367,500	+ 100,060
Montevideo	Oct.	30,153	33,203	52	380,[illegible]6	+ 20,444
Pernambuco . .	Jan. 5	5,467	5,734	1	5,734	+ 267
Peruvian .. .. $	Dec.	1,101,090	1,057,990	26	6,020,715	+ 67,555
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Dec.	5,438	6,188	52	71,992	+ 11,174
Shanghai .. .. $	May 29	24,611	24,708	21	523,298	+ 20,542
Singapore .. .. $	Nov. 2	12,517	13,385	44	611,062	+ 43,164
Toronto .. .. $	Nov.	1,052,000	1,071,106	48	11,716,181	+ 729,183
Winnipeg .. . $	Nov.	305,881	283,721	48	3,252,863	+ 213,466

WANTED.

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Issues of January 1 and 13, 1916, and August 16 and October 18, 1917, to complete files for binding.

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THE Tramway & Railway World
WITH MOTOR TRAFFIC SECTION

Founded 1892. LONDON, JANUARY 16, 1919. VOL. XLV.

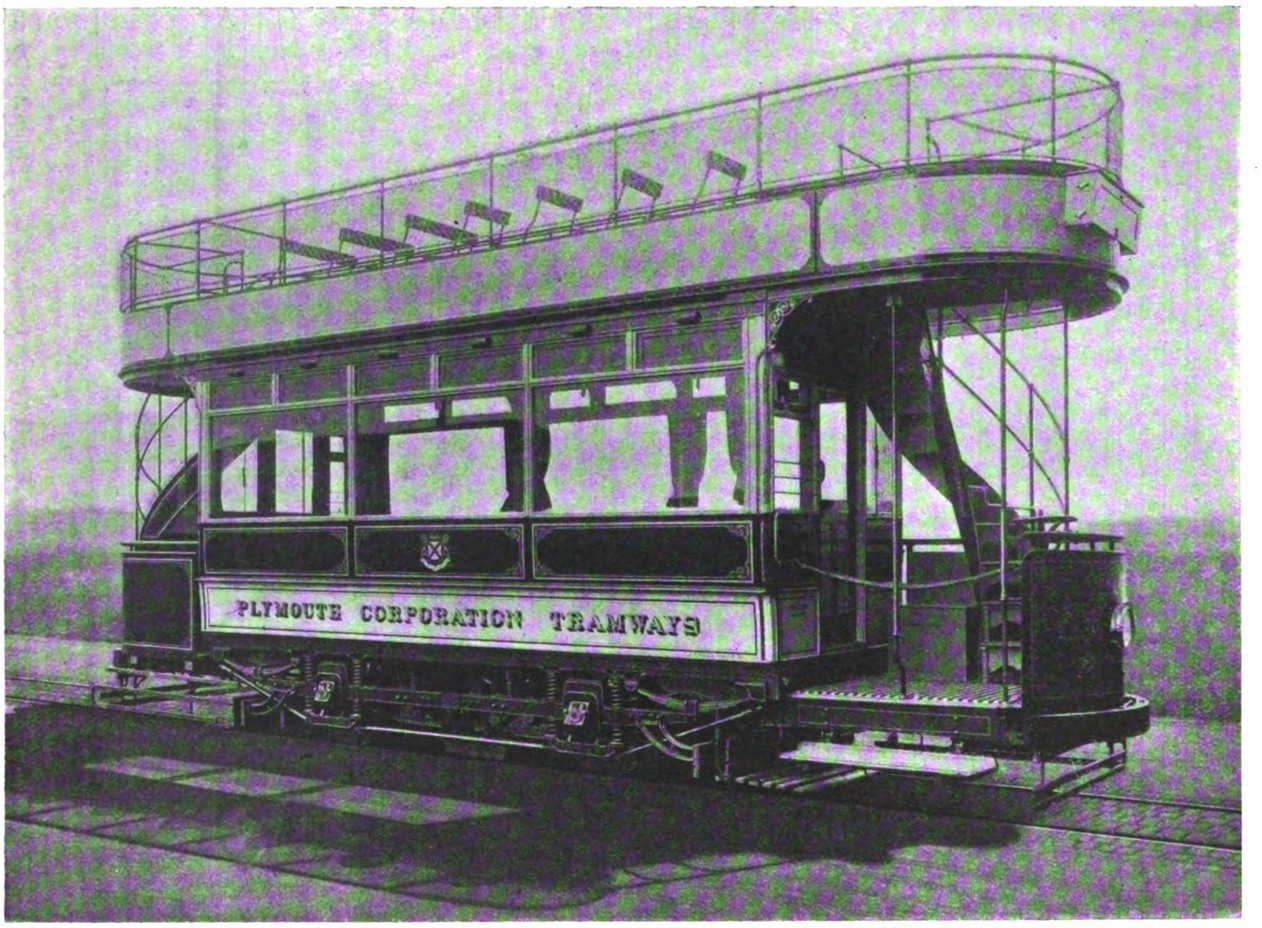
PLYMOUTH'S NEW TRAMWAY CARS.

A DESIGN ADOPTED BY THE CORPORATION AS THEIR STANDARD TYPE.

As a result of the absorption of the Devonport Tramway Company's undertaking by the Plymouth Corporation Tramways before the outbreak of the war, through running was instituted, and other means taken for increasing the traffic. The augmentation became so marked that the Corporation found it necessary to provide a considerable number of new cars, especially for the conveyance of workers to and from the dockyard.

During the four years of war the dockyard traffic has surpassed all records, and it was the certainty of this activity that enabled the Tramways department to obtain Government sanction to the provision of a number of additional cars. A full description of this type of car is appended, and it is worthy of note that the last consignment of cars is the third occasion on which this particular type has been supplied, a fact which speaks well for the satisfaction given.

The cars are of the single truck, double-decked type, and seat 54 passengers—24 inside and 30 outside.



Plymouth Corporation's Standard Car.

The general dimensions are:—

Length over body	16 ft. 8 in.
Length of each platform	5 ft. 5 in.
Length overall	28 ft. 4 in.
Length of wheelbase	7 ft. 6 in.
Width over side pillars	6 ft. 3 in.
Width overall	6 ft. 6 in.
Gauge	3 ft. 6 in.
Height inside	6 ft. 9 in.
Height, rail to trolley plank	9 ft. 11½ in.

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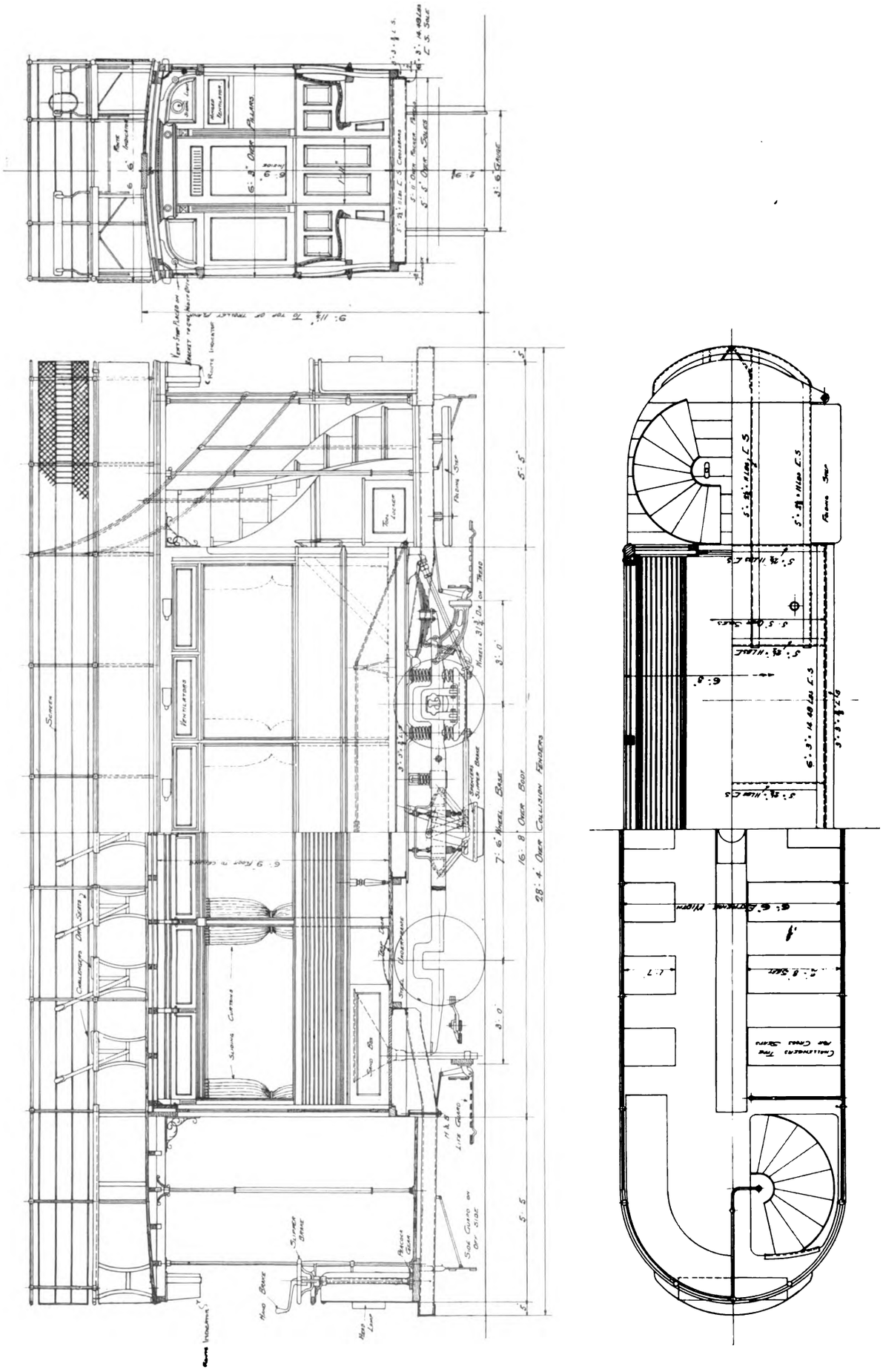

Elevation and Plan of Single Truck Top-Deck Car—Plymouth Corporation Tramways.

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The underframes are of steel rolled section strongly put together with angle knees, gussets, and rivetted; well braced and trussed in the most approved manner. The platform bearers are also of steel rolled section connected at the outer extremity to a collision fender of channel steel. Corner pillars, side and intermediate pillars, battens, and all longitudinal rails are of well-seasoned teak, the cantrails only being of pitch pine. The waist panels are of mahogany and rocker panels canary whitewood. The roof ribs of ash are strengthened by steel carlines with turned feet returned along the cantrails. The roof is of Carolina pine, covered with heavy cotton duck and rendered watertight. The upper roof is of T. and G. Baltic pine, $\frac{7}{8}$ in. thick, and furnished with wearing slats of hardwood.

The general inside finish is of oak, the seats being of lath and spaced, curved for comfort, the space below seats being unenclosed except at the ends over sand-boxes, where heel boards, with frames of oak panelled in ash, are fitted. The ceilings are of maple, veneer lined, decorated and broken up into panels by oak mouldings.

Ample ventilation is provided by means of the Brush system of pressed steel air ducts fixed along each cantrail, allowing ingress and egress of air through the perforated oak dado moulding, and also communicating with the otherwise sealed space between veneer ceiling and roof boards, thus preventing dry rot. In addition hinged ventilators are provided above the side windows, also a small ventilator in the door and a hinged casement at step side.

The windows are all of polished plate, and side windows are furnished with blinds. The usual mechanical bell communication is fitted, the cord passing through steel tubes which serve as a handpole from which leather handstraps are pendant.

Access is provided to the platforms by means of wood steps with malleable iron fittings made to hinge, the entrances being guarded by means of a chain stretched across the opening when the step is up. Protection screens and drills of ornamental galvanised netting are provided on the roof, attached to wrought-iron stanchions and surmounting rail, the latter being of brass tubing. The seats outside are of the Challenger dry seat type. Illuminated destination indicators are fitted immediately below the canopies.

Platform brakes of concentric spindle type are fitted, the ratchet handle operating the wheel brakes, the hand wheel manipulating Spencer's patent track brake. Sand gear of the Brush standard type is fitted, applying sand to both rails. Foot gongs are provided.

Lighting is furnished by three circuits of electric lamps and the usual complement of brass commode handles. All furniture is brass polished and lacquered, and up-to-date in pattern.

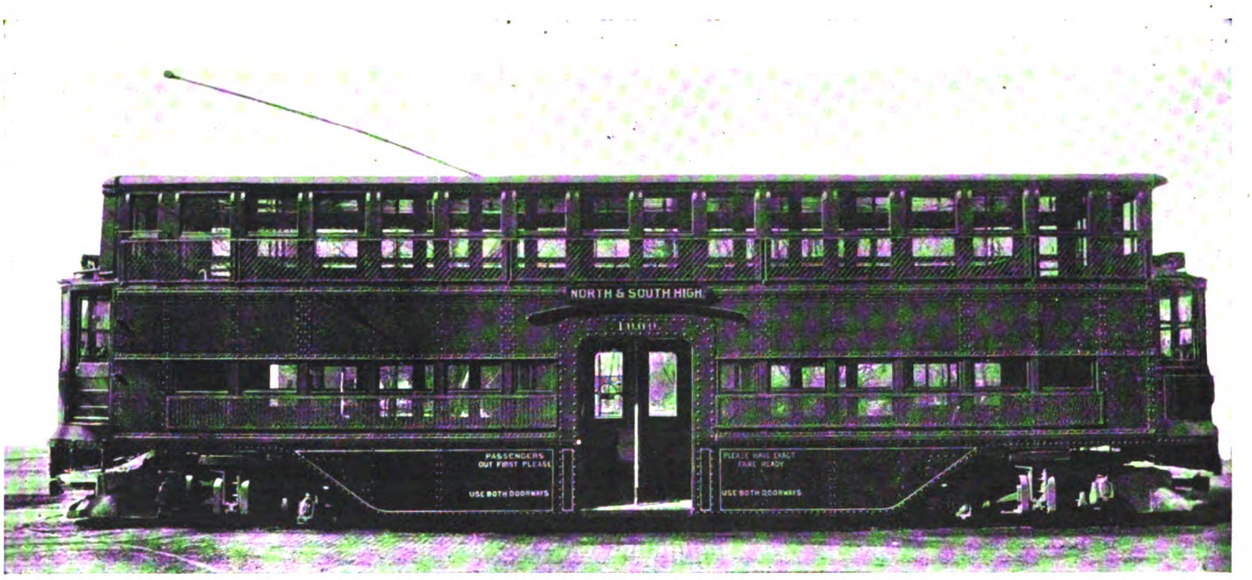
Various safety devices are provided, including Hudson Bowring lifeguards and Phillipsons' sideguards.

The truck is of the well-known Peckham pendulum P.22 type, built by the Brush Engineering Company, having a wheelbase 7 ft. 6 in., fitted with steel-tired wheels $31\frac{3}{4}$ in. diam. on tread on mild steel axles, and fitted with Spencer patent track brakes and arranged for two 221 railway motors of the British Westinghouse Electric and Manufacturing Company's manufacture. This latter company also supplied the power installation.

AMERICAN DOUBLE-DECK STREET CAR.

By R. W. A. Salter.

There are certain features about the car illustrated below which commend it to the attention of those who have anything to do with the tramways of this country. In the first place, double-deck cars are somewhat of an innovation in America—New York, Pittsburg, Washington, and Columbus (Ohio) being the only cities having them. Secondly, though following in general outline English practice, the car differs materially in arrangement and construction. Its design has evidently been carefully thought out in an effort to secure the most efficient type of cars for the required service.



A Double-Deck American Car with Low Centre Entrance.

Several cars of this type have been placed in service by the Columbus Railway, Power, and Light Company, and have fully met all expectations. The transportation situation in Columbus, it should be mentioned, presents a feature uncommon to any other large city in the United States. Out of sixteen routes worked by the company, ten diverge on to High Street, so that during the morning and evening rush hours most of the traffic is concentrated upon this one highway. Experiments were made with two-car trains; they were found too expensive to operate and, moreover, delay was caused

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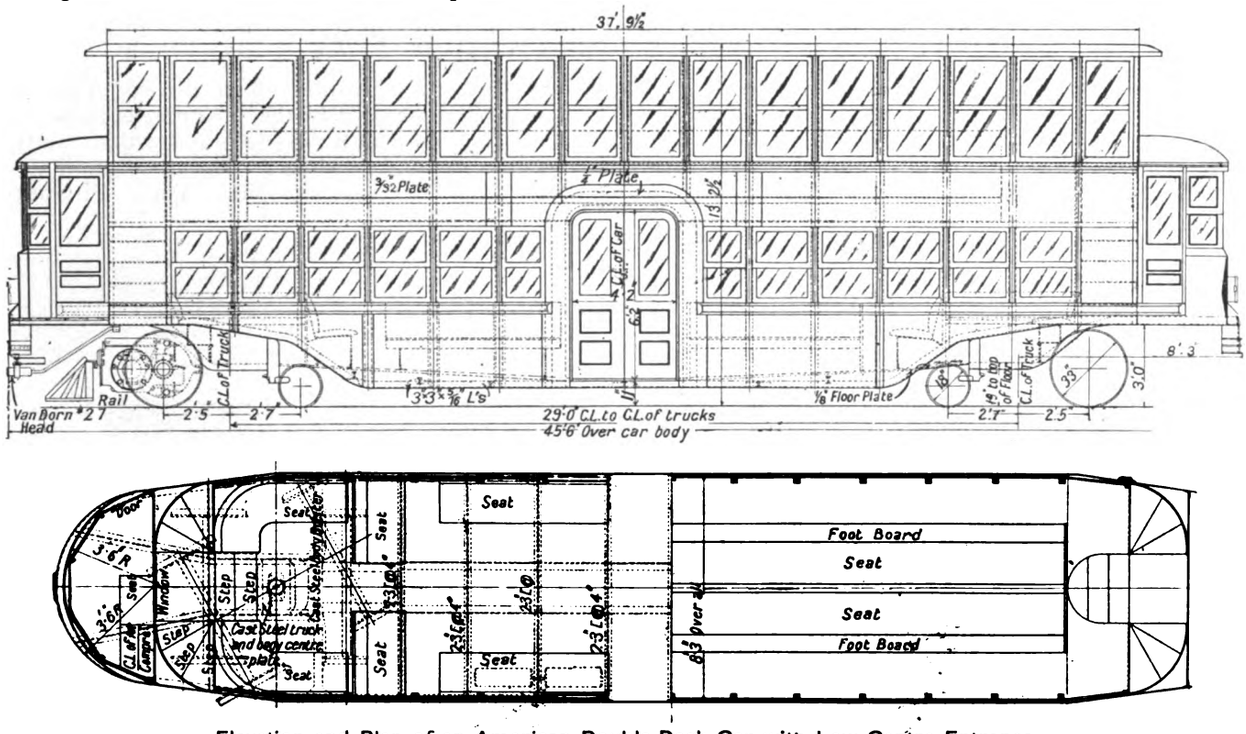
owing to the long stops. These were among the reasons which influenced the adoption of the double-deck car.

The car has a length over-all of 45 ft. 6 in., and an extreme width over the belt rails and eaves of 8 ft. 3 in. The trucks are on 29 ft. centres. The over-all height from top of rail is 13 ft. 2½ in.

Two G.E. 201-A motors are fitted. These are rated at 55 H.P. at 500 volts, or 65 H.P. at 600 volts. The equipment is designed for a schedule speed of 8½ miles per hour, but a maximum speed of 25 miles per hour is attainable. G.E. straight air-brake equipment is used.

The car fully loaded—80 passengers seated and 83 standing—weighs 69,085 lb. The seats of both decks are longitudinal, except the semi-circular seats and the two cross seats at each end of the lower deck. The seats on the upper deck are set back to back.

The car is of the low-level stepless type, the only means of entrance and exit being through the centre side doors. The entire centre of the car, for a width of 50 in., is devoted to receiving and discharging passengers. The conductor takes his position on a folding seat along the unused centre door and before him is a swinging desk. Entering passengers line up before this desk and after depositing their fares in the fare box pass on to the seats and stairways at both ends of the car. A forced-draft ventilator system is provided for both decks. The sashing and sheathings of the upper deck are removable for the summer months.



Elevation and Plan of an American Double-Deck Car with Low Centre Entrance.

NATIONAL JOINT COUNCIL FOR TRAMWAYS.

Some months ago it was expected that a National Joint Council for the tramway industry would be established without much delay. The draft constitution which had been approved by representatives of the men and the Councils of the Municipal Tramways and the Tramways and Light Railways Associations was submitted to the members of the Municipal Tramways Association at their conference in Leicester in September last. Some of the employees' local unions have, however, since raised objections to the scheme, and the London section of the Amalgamated Association of Tramway and Vehicle Workers has, we understand, definitely rejected the proposal. Unless the constitution is accepted throughout the industry it will, of course, be impossible to form a National Council as was proposed. National Joint Councils have already been formed in 47 trades.

AN AMERICAN VIEW OF BRITISH STANDARDISATION.

"The work of the British Engineering Standards Committee ought to prove, and undoubtedly has already proved," says the *Electric Railway Journal* of New York, "very valuable to the several standardisation agencies in the United States." Our contemporary continues:—"There may come a time when it will be advisable for these agencies to form some kind of an Engineering Standards Association in that country. Many of the standardisation achievements of such organisations as the Master Car Builders' Association, the American Railway Engineering Association, the American Society for Testing Materials, and the American Electric Railway Engineering Association have been very creditable, and indicate the possibilities that are ahead, but only a beginning has been made. There is much overlapping of jurisdiction on the part of the associations, and far too much exercise of individualism in design by engineers. To illustrate the latter point it is only necessary to mention the condition of electrical machinery a few years ago. Time was when each designer of a generator or motor wanted to express his individuality through it. Now all machines of this class look in general alike, and all are efficient in operation and reasonable in cost.

"An almost universal complaint that is made is that many association standards do not become real, that is, industrial standards. There must be good reason for this, and the blame cannot be placed on the industry. In many cases the standards are too academic. The purpose of the standardisations of the British Committee, as the American Association, is to secure interchangeability of parts, to cheapen manufacture, and to expedite delivery, all these desiderata being closely connected with the reduction of first costs and maintenance costs."

In conclusion, our contemporary asks if it is not time for American associations to co-operate toward standardising to these ends.

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BONDING IN RAILWAY ELECTRIFICATION.

By E. Capone.

The sole object of bonding is, of course, to obtain electrical continuity of the rails by joining together the separate lengths so as to form a continuous conductor either for electric signalling, supplying current to trains, or to act as a path for the return current. Bonding is done in a variety of ways, by means of plastic bonding, thermit welding, stranded strip, or solid copper with pin, solid, or expansion terminals. All these methods are employed under different conditions of work in order to make the steel rails into a serviceable conductor. A good deal of importance is attached to the efficient conductivity of the individual joints, as the sum total of resistance due to a large number of bonded joints in series may assume high proportions, and cause considerable loss. The fishplates give sufficient contact for operating bell circuits, but cannot be relied on as conductors for even a small current, therefore each length of rail may be considered as a separate and isolated piece of metal which it is desirable to join to the adjacent lengths so as to form a chain. In cases where track rails are used for the return circuit either on tramways or railways, where conductor bars or third rails are used as a means of supplying current, it is a matter of vital importance that the connecting up of the conductor rail lengths should be carried out as efficiently as possible. It is seldom possible, owing to cost and the mechanical difficulties of making a joint, to employ bonds whose cross sectional area is equal to that of the rails; the usual plan is to use bonds having from quarter to half the conductivity of the rail. Only in a few special cases does one find bonds of equal conductivity. With track rails on single or double lines there are two, four, or more paths for the return current, which reduces the area of the bonds, but with a single return or supply rail, or two lengths of light rail as in a conduit system, it is a somewhat different matter, as the area offered is only half or less, and the bonding in such cases usually has to be of a heavier nature to reduce as much as possible the resistance at joints. With track as return the rails are crossbonded, so that all the rails act in parallel, presenting a large area for the return current. Similarly in the case of supply conductor rails on two or more tracks it is usual to arrange section switches so that the conductor rails are used in parallel under normal service conditions, thus efficiently employing the combined areas. However, there are always twice the number of rails for the return current as for the supply, so the bonding of the conductor rail must still claim first place. There are certain Board of Trade regulations restricting the permissible drop in volts and density of current in return rails which must not be exceeded. The conditions imposed are intended to limit the liability of damage due to electrolytic action; this matter, although necessarily associated with track bonding, is more concerned with the location of points of return. Negative boosters are sometimes employed to relieve the drop at certain points, but this is outside the subject of bonding. Should a breakdown occur necessitating single line working on a portion of the line, all the current from adjacent tracks would have to be carried by one conductor rail. From this contingency one can appreciate the part played by the individual bond. A series of 150 or more go to a mile of rail, and one faulty joint would counteract the efficiency of the whole length; in the words of the proverb, the strength of a chain is in its weakest link.

Reviewing work recently done is at this moment of greatest interest, as the methods employed are the outcome of practical experience, and we now have the advantage of being able to continue on the lines lately adopted on electrified railways at home and abroad. Fig. 1 shows a bond with a steel centre which was adopted on one of our sytsems some years ago, and it may help to show the object aimed at when bonding. The core, which is in the form of a barrel with splayed ends, is cast in the centre of the copper terminal. The splayed ends are of hard steel projecting outside the faces of the terminal, and the centre portion of the steel core or barrel is of soft steel. The illustration shows the terminal in place ready for bonding, and also when bonded, and it will be observed that after the press has forced in the two projecting ends of the core it has also compressed the soft centre portion or barrel. This compression does not affect the hard ends, but compels the centre to take up a different shape by being forced from an oblong into a round, and in doing this forces the copper into contact with the sides of the hole, and since the terminal has already been driven into the hole a tight fit, it gains absolute metallic contact, and is also pressed out at the end as shown. Turning to the recent work of bonding, the old pin bond (Fig. 2) is still used owing to the fact that it can be put in under awkward conditions and dispenses with a bond press. The illustration shows the correct shape before and after bonding. This bond makes a thoroughly sound job, and will continue to be greatly in favour. The shape of the steel pin and hole in the terminal are so adjusted that when the pin is driven home a proper radial pressure of the copper is obtained throughout the length of the terminal.

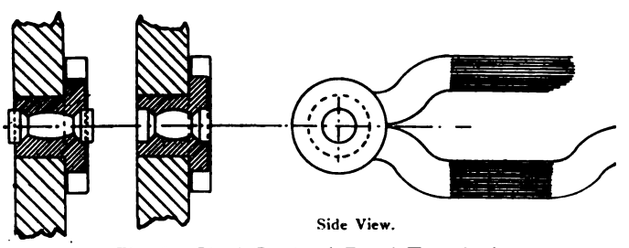

Fig. 1.—Steel Centred Bond Terminal.

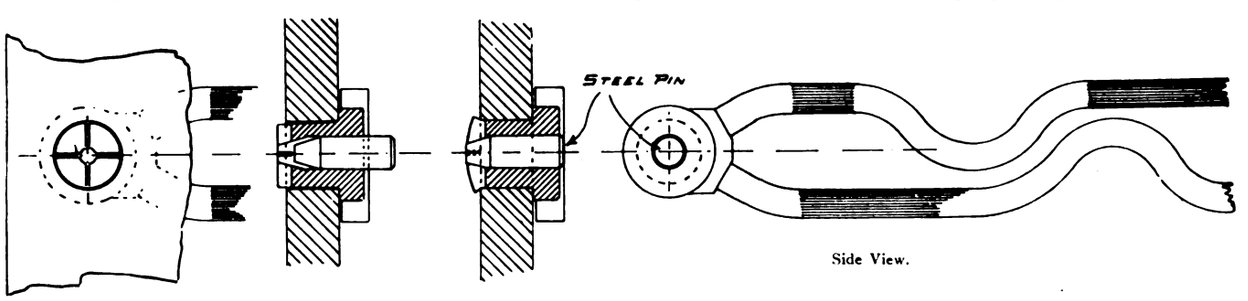

Fig. 2.—Pin Type of Bond Terminal.

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It will be noticed that where bonding is done with a pin or solid bond terminals (Figs. 3 and 4) the terminal projects $\frac{3}{16}$ inch through the hole; the object is to form a lip or rivet head which takes the part of a clamp holding the terminal rigid. It has been found that the vibration and movement at joints subject the bonds to severe strain, and this rivetting effect on a bond terminal gives valuable additional strength. Pin bonds may be viewed as a survival of the fittest, together with the use of the solid terminal type; the pin bonds can be used on special work where one man and a hammer are best adapted to combat obstructions in a limited space. They are also used where light bonding only is required.

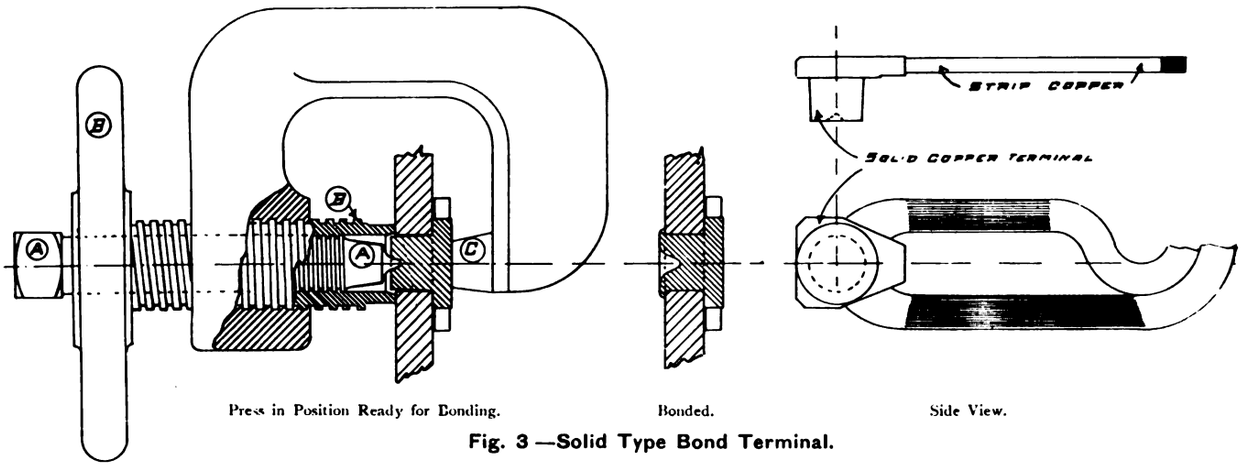

Fig. 3 —Solid Type Bond Terminal.

Solid terminal bonds can be looked upon as a standard article used at all main joints and connections where a press can be placed for compressing them. Fig. 3 shows the solid terminal bond with a hand press in position ready for bonding, and the shape of the terminal after the process is completed. Here again it will be seen that the point of the press acts the part of a pin by driving into the solid centre of the copper terminal, and forming a lip or rivet of the copper expelled from the centre. The press has two screws which have important functions. It is put into position so that the bond is lightly clamped between A and C, then B is screwed home hard by means of the wheel, thus forcing C against the bond terminal, and driving and holding it tightly in the hole. A, which is already in position, is then screwed into the centre of the bond by a long-handled spanner on the nut. This arrangement is necessary, as the terminal should be kept hard home in the hole whilst the point of screw A is finishing the work of forming the bond. In the old days hydraulic presses were often employed, but it can be safely stated that since hand screw presses manage the work equally as well they can be considered the most serviceable and portable tool. Something like 20 tons per square inch is obtained, and men can easily handle it with a little practice. The preparatory work of drilling and rimering holes ready for the insertion of bonds bears an important part towards the making of good joints. The holes are generally punched in the conductor rail ends at the works $\frac{1}{8}$ in. smaller than required, and the rimering to size is completed just before bonding. With track rails they are generally already laid, and have to be drilled in place, and, like the conductor rail, rimered to size just before bonding. If the holes are left for a day after having been rimered they must be thoroughly cleaned with a round emery stick before the bond is inserted. Holes that cannot be immediately bonded are often corked to prevent rust forming. It has been found, especially in warm, humid atmospheres, that rust will show itself in a few hours with some classes of soft steel rail, and any form of rust or dirt is detrimental to good metallic contact.

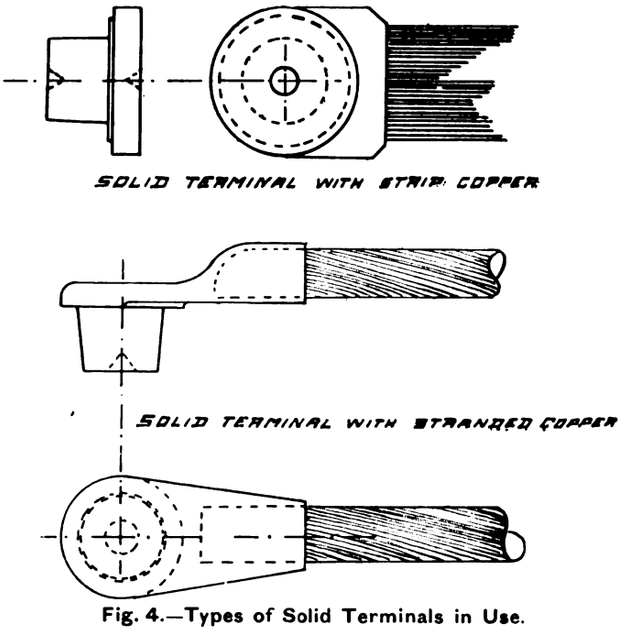

Fig. 4.—Types of Solid Terminals in Use.

The holes should be a tight fit for the terminal, and the edges of the holes slightly countersunk in case they should form a ridge preventing bond heads going home; besides if all the burr is not taken off it cuts into the terminal when driven in, and causes a copper ring under the head of the bond.

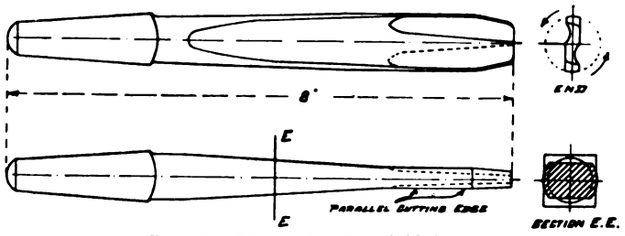

Fig. 5.—Rimer for Bond Holes.

It has been found in practice that drilling and rimering can best be done with special tools; twist drills and fluted rimers are hardly suitable for work of any magnitude, and experienced drillers pronounce in favour of the common boiler-makers' lip drill. The drills are cheap and strong compared with twist drills; they can also be reforged and sharpened; they stand the rough usage better. The class of rimers most

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successfully employed for finishing the holes is here illustrated (Fig. 5), and if carefully made and tempered they are greatly to be preferred. These tools have been found after considerable experience to be the most serviceable.

The employment of bonds outside fishplates (Fig. 6) is now only used on work under cover, or at points where there are track complications. It is obviously preferable and in practice found advisable to keep bonds protected wherever possible by placing them under the fishplates (Fig. 7); with the narrow strip or ribbon bonds this is now possible under most conditions, as the bonds can be bent and formed to give sufficient elongation to take care of expansion and contraction. The formation of these parallel strips of copper gives ample flexibility for any vertical movement they may be subject to. Stranded or cable bonds can also be used under the fishplates, but being round require more room between fishplates and rail, and this space is not always available.

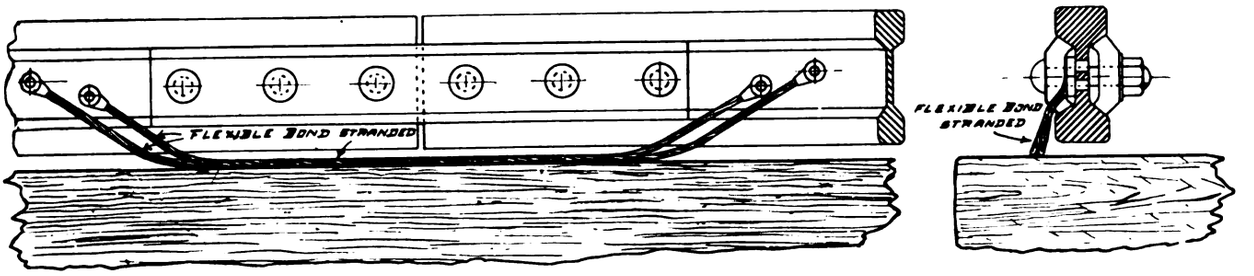

Fig. 6.—Method of Bonding Outside Fishplates.

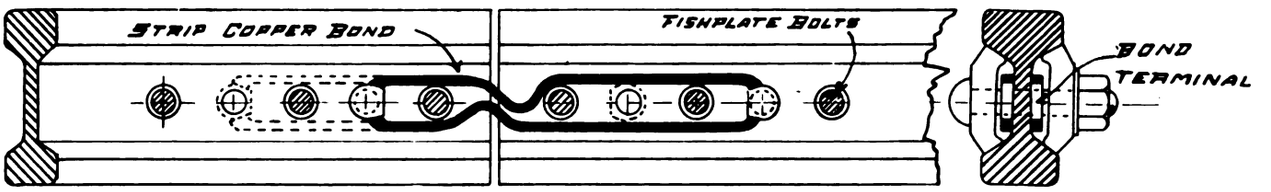

Fig. 7.—Method of Bonding Under Fishplates.

A few types of bond terminals are shown both for strip and stranded bonds (Fig. 4). On recent work it has been found advisable to paint bonds immediately after being fixed, using a preservative compound or hot tar. If the bonds are under the fishplates it is found necessary to pass a rod through the bolt holes in order to see that the copper strips or strands of the bonds will not foul the bolts. If this is not done the threads on the fishplate bolts are liable when being driven home to catch the bond and break some of the strands. The bonding of rails at each joint is but part of the work; at junctions and crossovers continuity of rail must still be maintained where the rails are separated and intersected. Fig. 8 shows diagramatically how this is usually done. The outside rails of a single or double track are continuous, since the switchpoints always operate on the inside. The outside rails may be diverted at turnouts, junctions, etc., but they remain unbroken by intersection. On double lines the inside rails are broken by frogs at the crossings and junctions, and to obtain continuity crossbonding is adopted as shown on the illustration at A. The bonding shown at both C and B is not necessarily installed on an ordinary crossover or junction, but is employed at special points, where owing to electric signalling certain rails are only available for the return current, in which case all track joints at frogs and crossings have to be spanned, since the area of rail return is greatly reduced, often only half the rails being available for return. Crossbonding is looked upon as a means of equalising or distributing the return current, using all the rails in parallel, and bonds are generally installed every 120 yards, from rail to rail, but when there are separate circuits, one for signal operating with alternating current and another for continuous current, or return for the traction side, the bonding and insulation become somewhat complicated. On a recent system embodying considerable complications the whole work of bonding was laid out in full detail, both for signal and traction circuits, including the location of all impedence coils and their connections. The care bestowed on this side of the work enabled the whole section of line to be tested and started in a few hours. One of the difficulties to be contended with in the installation of bonds is the provision for expansion and contraction; a concertina action takes place and has to be provided against, but provision has also to be made for track creepage; in this case the movement is all in one direction, lacking the redeeming feature of a return movement.

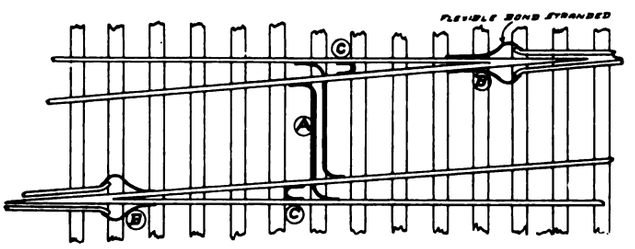

Fig. 8.—Continuity Bonding at Special Work.

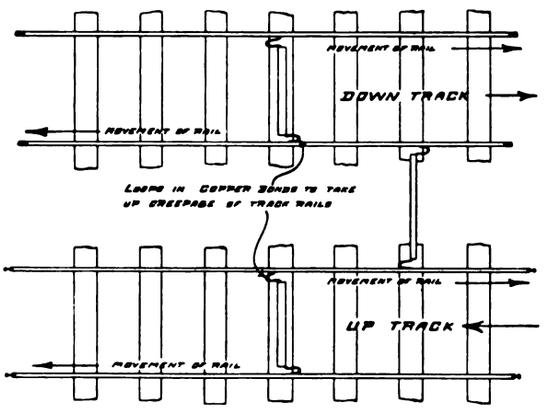

Fig. 9.—Method of Cross-Bonding to Allow for Rail Creeping.

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The rail moves or creeps continuously in one direction without any direct connection with any known laws, and the rate and extent of the movement can only be known by results. This subject is open to many views, but in any case to overcome the difficulty loops or bends are allowed in the bonds, which permit the rails to move without tearing the latter away. The method found best in actual practice is shown in Fig. 9, where the direction in which the rails move on up and down tracks is indicated. The whole question of bonding involves considerable forethought; for instance, the actual process has to be carried out without hindrance to traffic, but at the same time with a minimum loss of time to workers.

Bonding has been performed under ordinary conditions of traffic by the use of a few special tools, the work being expeditiously done in the day with the constant passing of trains. It will be readily understood that trains cannot be held up on account of the fishplates being off for drilling or owing to rail expansion when they cannot be put back. To provide against the first contingency special fishplates are put on in place of the ordinary ones; these special fishplates are only used during the drilling process. These are similar to those in use on the line except that they are provided with holes opposite the place where the holes have to be drilled in the rail to take the bond. These fishplates are put on immediately the ordinary plates have been taken off, and the drillers can then set to work and stop if necessary to allow the trains to pass. Often on the ordinary fishplates being removed the rails spring apart or close up, and it becomes impossible to replace them. In this case every gang of drillers and bonders is provided with fishplates of the ordinary type, but instead of the round holes for the bolts to go through, the holes are made oblong, which allows the bolts to be put through the rail even if it has opened an inch or more. By the employment of these two types of fishplates work can be carried out without difficulty at any time.

POSITION OF ITALIAN RAILWAYS AND TRAMWAYS.

The "Societá per Azioni" has published an interview with Prof. Tiaini, president of the Federation of Transports, on the position of the Italian railways and tramways. The Professor observed that as most of the railways in Italy are run by the State, it is forgotten that many railways and tramways are worked by private industry—4,000 kilometres of railway and 5,000 kilometres of town and inter-urban tramways. These railways and tramways are of great importance; they represent a capital of about three milliards of lire, with a gross yield of about a quarter of that of the great State railway system. Dealing with the difficulties caused by the war and the inadequacy of the increases in the tariffs, which were considerable, and of other concessions, the Professor said that the State ought to take a deeper interest in the affairs of the companies. The concessions already granted are not quite clear, and require a good deal of time allowance.

Owing to the enormous increase in the price of metal materials, both railways and tramways have been obliged to slacken in the maintenance of the rails and rolling stock. The equipment generally has seriously depreciated, and the locomotives and cars run with difficulty.

Preparations should be made at once for the work of reconstitution. The day when peace is declared, the manufactories of projectiles will have no more war work, and they will have to turn promptly to the construction of locomotives and cars. The gun foundries will have to start immediately rolling rails.

Professor Tiaini advises the institution of standardisation of materials in order to effect construction in series at a rapid rate and at prices easy to quote. If after the war, he continued, they wish to provide for themselves, they must prepare immediately, for nothing can be improvised. They must build up factories for electrical materials useful for traction work. This requires a certain understanding between users and constructors, because it is not a question of preparing new lines only, but rather of the repair of existing material and the adaptation and provision of equipment that should be prepared in time. The types of material would have to be submitted for approbation to the Government.

In the years preceding the outbreak of war there was in Italy a considerable development in the construction of railways entrusted to private enterprise; this occurred thanks to legislation granting increased subsidies by the State in order to stimulate such work. It is estimated that roughly there were 6,000 kilometres of railway and as much tramway under construction when the war started. Naturally the war necessitated the suspension of this work, and made the conditions attending the concessions very onerous, so much so that some of them had to ask for a moratorium. As a measure for giving employment to the great quantity of labour that will be liberated by peace they should begin now to initiate a recommencement of this work.

LONDON OMNIBUS SUBSIDIES.

Attitude of Municipal Authorities.

At the meeting of the London County Council, on December 17, the Highways Committee presented a lengthy report on the question of the subsidies paid by the Government to the London General Omnibus Company for omnibus services, the subsidies amounting to £98,000. It was stated that the conference of municipal tramway undertakings still has under consideration questions arising in respect of the matter, and that a further report would doubtless be submitted later. The present report consisted largely of correspondence between Mr. T. B. Goodyer, who acted as secretary of the conference, and the Ministry of Munitions.

Mr. G. H. Hume, chairman of the Highways Committee, stated in reply to a question that disclosure was first made in the House of Commons that the Government were making financial grants in respect of omnibus services in the south-east of London. A deputation, representing municipal tramway enterprises, attended before Mr. Kellaway (Ministry of Munitions) and a representative of the Board of Trade, to submit the case of the municipal tramways authorities. Mr. Hume said he then pointed out that, before making grants in respect of new or increased omnibus services, they should consider whether the subsidised service was necessary in the national interest, or whether existing means of transit were adequate. After considerable correspondence, the Minister of Munitions had expressed himself satisfied that the best steps were taken to meet the situation created by war emergencies.

Dr. Scott Lidgett said they were moving towards a position in which they might claim fair play for municipal undertakings.

Mr. Squires described the subsidy as most astounding. If anyone deserved a subsidy from the Government for services in carrying workpeople during the war, it was the London County Council.

Mr. Hume subsequently remarked that the traffic of London was in a state of chaos, and he thought the attention of Parliament would have to be forced to bring the matter to a head.

East Ham Tramways Committee have received from the manager (Mr. W. C. Ullmann), a report as to the subsidy made by the Government to the London General Omnibus Company. Alderman Anstead has taken part in a conference with Mr. Kellaway, Parliamentary Secretary to the Ministry of Munitions, who has advised that a small committee of tramway managers be formed to discuss the matter with the technical officers of the Ministry. After receiving the report of these officers, Mr. Kellaway will consider what further steps can be taken.

Tramway Wages Award Effect.—The recent award to tramway employees increasing their wages to 30s. above the pre-war rate will entail heavy charges on both Corporation and company-owned tramways. It is estimated that the increase will cost the London County Council tramways department £110,000 per annum. For the Sheffield Corporation tramways the cost will be over £24,000.

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AGRICULTURAL LIGHT RAILWAYS.

SUGGESTIONS BY THE MINISTRY OF RECONSTRUCTION.

The importance of the development of light railways and of motor transport for the opening up of agricultural districts was forcibly emphasised by the Prime Minister during the recent General Election. A point still to be decided, and one on which strife will perhaps arise between advocates of different systems, is the relative spheres of light railways and of motor lorries and wagons. A wise and comprehensive examination of the subject by the promised Ministry of Transport will find suitable spheres of operation for both, so that one will be auxiliary to the other. A system of light railways would, undoubtedly, be of great benefit to the rural districts, but it need not be supposed that for some time at least there would be much return on the capital invested. It was shown in an elaborate report made to the Board of Trade by Lieut.-Col. Yorke, in 1912, that the average dividend on capital yielded by the elaborate system of light railways in Belgium was only 2·8 per cent. Some of the railways paid well and some paid nothing. This was over undertakings aggregating 3,000 miles in length. The capital was provided by the State, by the provinces, and by the communes, and the lines were leased out. Some such comprehensive scheme would appear to be necessary in this country also, if agriculture is to benefit by the means suggested. From the point of view of the electrical industry, the scheme offers considerable prospects in light and medium electric traction work.

The Ministry of Reconstruction have recently presented a detailed report to the Government on the subject of transport in rural localities. In February of last year Dr. Addison sent to the county councils and other local bodies a letter inviting their views on reconstruction questions generally. A large proportion of the replies suggested, among other things, an improvement in rural transport, and particularly in the means of inter-communication between villages and the places at present served by railways.

After a careful consideration of various methods of meeting the demand, the Department favours the development of an extensive system of light railways, which, because they will be directed primarily to the promotion of agriculture, it is proposed to call "agrails." The form of transport contemplated is neither a light railway nor a tramway in the ordinary meaning of these terms. The track would be a kind of tramway, cheaply constructed and easily laid and lifted, of 2 ft. gauge. It would be laid on the road, or, where the road was not sufficiently wide, over ditches or waste land alongside the road.

A single track would be used, with loops at frequent intervals, and fencing and signals would be reduced to a minimum. Though the gauge would be narrow, the trucks might have a considerable overlap, and, though it would be inadvisable, for the sake of the light track, to run such heavy loads, there is stated to be no reason why the trucks should not have the same capacity as standard gauge wagons. Passenger cars of some type still to be settled—possibly of the toast-rack pattern—would be run; but the primary purpose of the railways would be the carriage of agricultural supplies and produce, coal, road materials, etc. The speed would not be very high; the motor traffic limit of 20 miles an hour is suggested.

The traction would be mainly by steam or electricity, according to local conditions, and where the rails were carried into sidings on private farms, petrol tractors or horses would draw the wagons. Possibly by the use of containers, it would be feasible to run loads direct from the "agrails" to the ordinary railways with which they would be joined, while another possibility is the invention of a device whereby a wagon might serve both for road transport and for "agrail" journeys.

No great difficulty is anticipated in connection with materials or land. There is much light railway material lying in France and elsewhere, and, even assuming that the equipment in France is taken over by the French Government, the plant for making the material and the habit of making it have been fully acquired in this country. As to land, it is assumed that both in process of acquisition and in method of valuation the general principles laid down by the Committee of which Mr. Leslie Scott was chairman would be followed. As the "agrails" would be laid mainly on the roads, the land to be acquired would not be large.

The function of the Ministry of Reconstruction in this matter is advisory, and the carrying out of their plans or any others which may be accepted by the Government and authorised by Parliament would probably be entrusted to the Ministry of Transport, which the Government propose to create under Sir E. Geddes.

An experimental light railway scheme is being worked out at Biggleswade by the Board of Agriculture. Military material which was lying there is being used, and it is hoped that the experiment will demonstrate that the saving in the cost of road upkeep by the withdrawal of heavy market traffic will more than cover the interest on the local authorities' share of the capital expenditure.

NEW AND PROSPECTIVE WORK.

Doncaster Corporation are arranging for the purchase of ten new tramway cars.

Rotherham.—Rotherham Tramways Committee estimate that an expenditure of £100,000 will be necessary to double the tramway track.

East Ham Corporation will shortly require new cars, and it has been suggested that motor omnibuses should be obtained in order to relieve the tramway traffic.

Walthamstow.—Reports on railless traction are to be supplied to the members of the Walthamstow Tramways Committee, who are further to consider the subject.

Hull.—Tramway extensions are contemplated after the war has been brought to an end. The Tramways Committee have requested a sub-committee to report upon the schemes proposed.

Pontypridd.—The Council have requested the surveyor and the electrical engineer to report upon the proposed extension of the tramways at Treforest. It was decided recently that action should be taken to further the scheme.

Maidstone.—Tramway extensions at Maidstone to the length of nearly a mile and a half were anticipated in a speech by Alderman D. T. J. Lyle (chairman of the Tramways Committee), at a meeting of the Corporation. The prospective route for new tramways between Maidstone and Chatham is under consideration.

Bournemouth.—At a meeting of Bournemouth Council it was reported that an urgent request had been made to the Tramways Committee by the Government for an estimate of the quantities of rails and points and crossings likely to be required during the year 1919. The town clerk was instructed to reply that the committee did not propose to estimate for rails in 1919, but they might require 1,000 tons in 1920.

Leeds.—Mr. J. B. Hamilton, general manager of the city tramways, reported to the Tramways Committee that there were approximately 10 miles of permanent way requiring immediate renewal, for which purpose a sanction for 2,000 tons of rails had been obtained from the Board of Trade. There were at present in stock about 130 tons of rails, sufficient to make a start on a length of three-quarters of a mile, which would tax the capacities of the present staff, assisted by contractors, for a period of two months.

First Invitations for Tenders since the War.—The advertisements for tenders for tramway cars from Sheffield Corporation and for motor omnibuses from Liverpool published in our December 19 issue have occasioned much interest. *The Times* said "these are the first announcements of the kind issued by Corporations since the outbreak of war." *The Sheffield Telegraph* remarked that "there is scarcely a tramway undertaking in the country which is not in need of new cars, while hundreds of miles of track require reconstruction." *The Morning Post* observed that "the publication of these announcements in THE TRAMWAY AND RAILWAY WORLD is an indication of the early revival of business."

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THE

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Goods Traffic.

Throughout the whole history of electric traction it has been a peculiar fact that this method of locomotion has in the overwhelming majority of cases been applied to passenger traffic only and not to the transport of goods or minerals. In this country, so far as tramways are concerned, the electric tramway was the development of the horse-car system, so that it is not surprising that only in recent years have any systematic attempts been made to cultivate goods and mineral business. Among the difficulties which have stood in the way is the necessity for constructing sidings into railway yards and manufacturers' premises. As to electrified railways, the prime reason for the change was to increase the speed and carrying capacity of passenger services. Only in a very few cases in England are merchandise or minerals hauled electrically. In the United States also electric traction was primarily developed for purposes of passenger transportation. It is true that there are now some electrified railways which carry heavy mineral and freight services, but they are not numerous. The most surprising thing is that the interurban electric railways, which were built as electric lines, and are often in competition with steam lines, have done little in the way of goods and mineral services. Perhaps the reason is that many of these railways have not got their own right of way in the towns, but are really street tramways in their urban sections. Hence, like tramways in this country, they cannot readily have urban goods stations. Despite legislative obstruction there has been a good deal of agitation here in favour of developing goods haulage on tramways, and under post-war reconstruction there is a prospect of something being done. In America it appears that a similar agitation is on foot as regards the interurban electric railways. In that country there is an additional reason for the change, and one which is likely to become more marked here as our tramway systems are extended.

Motor Vehicle Competition.

This reason is the development of what are called in America motor trucks. These vehicles, if not quite the same as our motor lorries, serve the same purpose. They carry goods between town and town, set down and take up at the factories and the farms along the way, and compete with the steam railways. They can hardly be said as yet to "compete" with the interurban electric railways, because the latter have done little to try to develop a goods service. The position of the "interurbans" was discussed at a recent meeting of the Central Electric Railway Association at Indianapolis, when a paper was read by Mr. Charles J. Laney, traffic manager of the Northern Ohio Traction and Light Company. He suggested that the electric railways should put more life into their traffic departments, find out why motor truck transportation makes an appeal in their territories, and apply a consistent remedy. The railways should go after the business, and they will obtain it. Some of these trucks carry a load of as much as five tons, and they do great damage to the roads, for the maintenance of which they pay nothing, though the railways have to pay a share. It appears also that there are no laws concerning motor trucks, and the latter accept freight for return journeys at very low prices. On the other hand, the railway rates are governed by the State authorities. The contention was put forward that motor trucks should be made common carriers, and placed under the jurisdiction of the State Commission, and that they

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should be required to pay so much per ton-mile for maintenance of the highways. In all these things there are lessons for this country. We are promised a great development of inter-urban tramways and light railways, and there will be a specially rapid development of the use of motor lorries owing to the great numbers of these vehicles which will shortly become available for commercial purposes on being freed from military service. If rail-borne goods traffic on roads is to have a fair chance, conditions must be made equable. The more road traffic is carried on rails, the less the cost for highway maintenance, and that consideration alone, apart from questions of efficiency and speed, makes it necessary that the tramway and light railway should do as much of the freight business as is suitable for them.

The Wages Problem.

To tramway undertakings as well as to some other branches of industry the present wages problem presents an aspect which is peculiarly acute. In many if not most industries employees are demanding and are obtaining higher wages and shorter hours of work. The contention has been put forward on behalf of labour claims that the employers may be able to recoup themselves by the more extensive use of labour-saving machinery and by employees working at higher pressure during their shorter hours. In these ways it is claimed that production may be largely increased. One remark which may be made is that it will not be easy to get men to work more diligently and intensively if trade union customs are to be restored. The "ca' canny" principle will not easily be overthrown. But for the sake of the present argument let us suppose that it is, and that relief is found through substantially increased production. Another contention, which is applied specially to the railways, is that unification of operation and control will produce large economies. Let that also be granted. But these factors, important as they are, do not apply in the case of the traffic staffs of the tramways. Unification of working and control of the tramway undertakings of the country is obviously impossible. As to the other two remedies, increased use of machinery and more diligent labour, it may be possible to apply them in the repair shops and even to some extent in the work of track maintenance; but they cannot be brought into use so as to increase the efficiency of the traffic employees who form such a large proportion of the total. A manager cannot by the use of machinery enable a man to drive more than one car at a time. Neither can he by any ingenuity contrive that one conductor shall collect fares on several cars simultaneously. Similarly, increased diligence and energy on the part of drivers and conductors can do very little to increase the number of car-miles per car per day. The average speeds, limited in part by the Board of Trade and partly by the street traffic, cannot be very appreciably raised by increased desire on the part of drivers and conductors to do their very best. In short, unlike the case of a factory, production cannot be materially increased. The only remedy apparently is to come down once more on that general beast of burden, the British public, and raise the fares. A good deal has already been done in the way of increasing fares, and with satisfactory results. But a point must be reached where a further increase of fares will not produce an increase but a decrease of gross revenue. If not before then, certainly then, the limit of increased wages and reduced hours will be reached.

Traffic and Development Board.

It is gratifying to learn that there is a prospect of a successful issue to the persistent advocacy in these pages of the establishment of a Traffic Board for Greater London. Time after time we have emphasised the importance of this matter since the recommendation of the Royal Commission on London Traffic to the Government of 1905. The difficulties entailed by the war made the existence of such an authority still more desirable, and the case was strengthened by the Reconstruction Reports issued last year on such matters as the electricity supply of the country and the obstacles to the development of electric traction. Add to these levers the pressing matter of housing—upon which the County Council of London alone proposes an outlay of over two millions sterling—and the case for action becomes irresistible. Without adequate means of transit a housing programme becomes impossible of achievement, for Greater London has overflowed into large areas

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of surrounding counties. We pointed out in our issue of November 14, 1918, in reference to the action of the Housing Committee, in presenting a report upon housing and traction without the aid of the general manager of their tramways, that the result of their deliberations served simply to show the need of the problem being given more comprehensive and expert treatment. That view of the subject has evidently influenced Government authorities, to wit, the Minister of Reconstruction and others, through whom the Prime Minister must perforce act if he intends to have carried into effect his great policy of meeting the housing deficiencies of the past half-dozen years. For that purpose the Traffic Board idea has been extended into a Traffic and Development Board for London and the Home Counties. Such action should lift the Traffic Board idea out of the limited sphere of County Council control, which has been one of the obstacles that has hitherto prevented Government action. It is true that the party in power on the Council during the past six years have had a wider conception of the matter than the party that held the reins for so many years up to 1913, and that they have more than once urged the Government prior to the war to take action. But even their broader-minded scheme did not allow for the predominant parts that housing and the provision of arterial roads must play in any scheme for setting up a traffic authority. However, both parties now recognise the immensity of the problem. This was shown by the report of an interview which Mr. G. H. Hume (leader of the Moderate majority of the Council and chairman of the Highways Committee) recently gave to the *Morning Post* on the subject of a larger administrative area. For the want of that area negotiations on the electricity supply came to naught. By great tact the Local Government Board managed to get the multitude of authorities to come to an agreement on the question of arterial roads, but the housing problem presents obstacles that have the appearance of being insurmountable. No surprise need therefore be felt at the announcement that a Committee is sitting to draft a Bill for a Traffic and Development Board for an area extending far into the Home Counties. All parties may be congratulated upon the circumstance that the chairman is Mr. Rees Jeffreys, who is completely detached from any influence, and has shown organising ability, first as secretary of a national motoring body, and since 1911 as the first secretary of the Road Board, from which he has now retired.

DEATH OF MR. STEPHEN SELLON.

We deeply regret to record the death of Mr. Stephen Sellon, M.Inst.C.E., which occurred suddenly on December 21 while he was travelling to London from Edinburgh. In Mr. Sellon's death the tramway world suffers a loss that will long be felt. He was a pioneer of electric traction, and for the past twenty-five years and more he had done valiant service in the development of tramway and light railway facilities in this country. In these days it is difficult to realise the strength of prejudice and the force of the inertia which the early pioneers had to overcome in introducing electric traction. Mr. Sellon in a few years became the best known expert witness in tramway Bill investigations by Committees of the Houses of Parliament and at light railway inquiries by the Light Railway Commissioners. The last Parliamentary Bill in which he appeared related to the Sheffield Corporation's application last session for powers to carry goods on the tramways.

In early life Mr. Sellon gained railway engineering experience, and later was engaged on the construction of the Barry Railway and the Manchester Ship Canal, but from 1893 he devoted his attention almost wholly to electric tramways and light railways, varied by work on several Irish relief railways for the Irish Light Railway Commission, and by the construction of the Wolverton and Stony Stratford Light Railway, and the Newport Pagnell Tramways. Mr. Sellon was responsible for the introduction of electric traction in Leeds, where he was given a concession to electrify the Roundhay line, the work being carried out by the British Thomson-Houston Company. This line, on which service was begun in November, 1891, not only proved successful, but it also served the useful purpose of a demonstration to local authorities and others of the advantages of electric traction. After service on the Board of Trade Committee, which framed the Light Railways Act of 1896, Mr. Sellon was responsible for the equipment of numerous electric tramways carried out by the British Electric Traction Company. At various times he also acted as consulting engineer to a number of tramway companies and municipal authorities, including the Bristol Tramways Company, the London United Tramways, the Metropolitan Electric Tramways, the North Metropolitan Electric Power Supply Company, the South Metropolitan Electric Tramways and Lighting Company, etc. He prepared all the traffic estimates for the London Tube Railways. He was an active member of the Tramways and Light Railways Association, and of late years he had devoted great attention to forwarding the case for reform in tramway and light railway legislation, and he gave evidence before the Committee on Electrical Industries whose important report was issued last year. He performed most valuable work as a member of the Board of Trade (Tramways) Committee, upon which his geniality conduced greatly to the despatch of the arduous work upon which the Committee was engaged.

At the meeting of the Executive Council of the Tramways and Light Railways Association, on January 6, Mr. Howley, in the unavoidable absence of Sir Arthur Stanley, moved a resolution expressing the sympathy of the Association with the relatives of Mr. Stephen Sellon, who was one of the founders of the Association and a prominent and valued member. He had been a vice-president of the Association for many years, and at the special request of the Council regularly attended their meetings. Mr. T. B. Goodyer seconded the resolution, which was agreed to by the members silently upstanding.

MUNICIPAL TRAMWAYS ASSOCIATION.

Appointment of Honorary Secretary.

Mr. G. W. Holford, general manager of Salford Corporation Tramways, has, with the consent of the Salford Tramways Committee, accepted the appointment of honorary secretary of the Municipal Tramways Association, in succession to Mr. W. Clough, whose resignation was recently announced. Mr. Holford is well known in the tramway industry. He has been general manager of the Salford Tramways since 1902 and has been a member of the Executive Council of the Municipal Tramways Association for many years. He has also acted as honorary secretary of the Lancashire and Cheshire Tramways Managers' Association for the last eight years.

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N.E. COAST LOCAL AUTHORITIES AND ELECTRIC POWER SUPPLY.

The recent reports by the Government's Coal Conservation Committee and the Electric Power Supply Committee have stirred up the local authorities on the north-east coast of England to put forward strong statements of their views. The Corporation of Newcastle have adopted a report by their Parliamentary Committee, and the north-east coast local authorities jointly have issued a statement and sought for an interview with the President of the Board of Trade and the Minister of Reconstruction on the subject.

The Newcastle Parliamentary Committee in their report say :—

The Committee are apprehensive that, if the proposals of these reports receive legislative sanction, the monopolies of the private electricity companies in this district will be maintained and consolidated, and that the publicly-owned undertakings which generate and supply electricity in bulk in Newcastle-upon-Tyne and in other parts of the north-east area of England may pass from the ownership and control of the municipalities who at present own them, and be wholly dominated by a company or aggregation of companies conducted for private profit, enjoying (possibly with financial assistance from the Government) a monopoly of electrical enterprise in this area ; while at best municipal electricity undertakers will be reduced to the position of distributors in their own areas of electricity supplied to them in bulk by the companies.

The Committee are of opinion that it would be contrary to public policy that a public utility service of this character which is a monopoly should be under the control of private companies, the tendency during recent years having increasingly been to place such services under the management or direction of local representative bodies ; and in view of the circumstance that the Corporation have a right of acquisition within six months of July 3, 1922, of the electric lighting undertakings in the city of the Newcastle-upon-Tyne Electric Supply Company and of the Newcastle and District Electric Lighting Company, and are themselves already generators and suppliers of electricity for purposes of traction and power, the matter is regarded as one of extreme importance in the interests of the city.

The town clerk has prepared a statement which has been settled in consultation with representatives of other local authorities in the north-east area who are owners of electricity undertakings.

It is proposed that this statement, when approved by the other authorities, shall at an early date be formally presented on behalf of the municipalities to the President of the Board of Trade (Sir Albert Stanley) and to the Minister of Reconstruction (Dr. Addison).

The statement referred to in the above report has been prepared on behalf of the following local authorities :—Berwick-on-Tweed Sanitary Authority, Middlesbrough, Newcastle, South Shields, Stockton, Tynemouth, and West Hartlepool. Sunderland and Darlington were not parties to the statement, and it was stated that their view was that they would be able to claim exemption from any scheme of unification. In the course of the statement it is said :—

The reports of the Government's Committees invite the recognition by Parliament of proposals so wholly at variance with the ordinary practice respecting public utility services, and so subversive of the necessary local public control of electricity supply, that the municipalities have deemed it desirable to formulate their main grounds of objection.

The municipalities concede that the unification of the production and distribution of electrical energy for areas sufficiently large but carefully defined is desirable, provided that the best use is made of existing systems of generation and distribution, that the generation and distribution of electrical energy is under local public control, and that proper and reasonable safeguards are adopted in the interests of existing undertakers and consumers, and in particular that those municipal undertakings which can, in the opinion of the Electricity Commissioners, be economically worked without interfering with the efficiency of any general scheme, should continue to be owned and operated by their present owners.

Limitations of areas of supply have in the north-east coast area operated to restrict expansion and to limit economy of production in regard to municipal electrical undertakings, to an extent markedly greater than has been the case with respect to private supply companies, and in so far as the reports affirm the desirability of widely extended areas of supply, the municipalities are in agreement with the recommendations of the reports.

With respect, however, to the Coal Conservation Sub-Committee's report, the municipalities cannot ignore the fact that a report purporting to deal with problems of national economy in coal consumption has been utilised as a vehicle of attack upon the policy of municipal control of electricity undertakings, and has been made the means of promulgating proposals which, if carried into effect, may be expected, in the north-east coast area, to consolidate the position of the Newcastle-upon-Tyne Electric Supply Company and its allied and subsidiary companies, and to involve the subordination of municipal electrical undertakings to the dominance and control of the north-east coast group of power companies.

The report of the Coal Conservation Sub-Committee is accepted by, and has clearly influenced the Electric Power Supply Committee in arriving at their conclusions. The report cannot, however, be regarded as presenting any elements of finality, nor as offering other than the expression of the individual opinions of its framers.

Its conclusions are sought to be supported mainly (i.) by an estimated coal saving of 55 million tons per annum, and (ii.) by a comparison between the average charge for electricity in the north-east coast area and the charges of a number of municipalities in the southern parts of Lancashire. The municipalities challenge the statement that a coal saving such as is estimated will be effected, and they are prepared to give in detail the grounds upon which they dispute the accuracy of this estimate.

The adverse comparison sought to be drawn by the Coal Conservation Sub-Committee between the alleged "average charge of less than ½d. per unit" of the north-east coast supply companies and the charges of the Lancashire municipalities, is misleading and mischievous. No details are vouchsafed showing how this alleged average charge is arrived at, and the municipalities deny that it is in any sense a true and accurate representation of the facts. On the contrary, the municipalities assert that where all material factors are taken into consideration, the charges of the north-east coast supply companies will be found to approximate very closely to those of comparable municipal undertakings.

Even should the allegation of an *average* charge of less than ½d. per unit be justified, the comparison is none the less misleading and fallacious, because the statement in Table V. of the Coal Conservation Sub-committee's report, purporting to give the average prices charged for power by the Lancashire municipalities, gives prices which include the cost of distribution and other incidental expenses, and relate very largely to low tension units supplied to consumers on their own premises, whereas a large proportion of the units supplied by the north-east coast supply companies are high-tension units supplied in bulk to the distributors and users of electrical energy who, generally speaking, have to add the cost of transformation, and in some cases that of distribution, together with their profit, in the price actually charged to the ultimate consumer.

As regards the proposals of the reports respecting the constitution and powers of the proposed Board of Electricity Commissioners, the municipalities recognise the desirability of the establishment of some central and impartial authority charged with the duty of fostering electrical enterprise and encouraging the use of electricity as a source of motive power in industrial concerns.

The municipalities, however, view with grave concern as a dangerous extension of the policy of bureaucratic control the proposal to confer powers which for all practical purposes will determine the development of electrical enterprise throughout the country upon a small body of permanent officials, who will be supreme over all existing and future electricity undertakings, appointed by the President of the Board of Trade without reference to any superior authority, three of whom will hold office subject only to an age limit, and two of whom will be appointed for a short term of years.

A small body of technical experts, however eminent individually, is in the view of the municipalities unfitted to be entrusted with autocratic powers of the character proposed, and the central electrical authority should be so constituted as to be directly susceptible to the influence of public opinion, and should comprise a sufficiency of members of independent judgment and general experience.

It is essential that any such central electrical authority should be free from partisan bias.

The first Board of Electricity Commissioners should, it is submitted, either be appointed directly by Parliament, or be constituted in accordance with directions given by Parliament so as to secure an impartial and judicial body.

With respect to the delimitation of electrical districts and the constitution of District Boards, all the facts are ascertainable immediately, and these questions it is submitted should be disposed of by direct Parliamentary action after preliminary local inquiries.

It is unreasonable that any embargo should be placed upon extensions of existing electrical undertakings during any interval which may occur before the suggested super-power stations are in a position to supply power, especially as the commercial necessities of the situation may demand an immediate increase in the supply of electric power, which, the municipalities submit, can be effected quickly and economically by enlargements and extensions of the plant of existing undertakings.

The municipalities have already commented upon the pronounced anti-municipal bias of the Coal Conservation Sub-Committee's report. This bias, while not so directly expressed in the report of the Electric Power Supply Committee, is none the less present therein, and the municipalities fear that if its proposals are put into effect the result in the north-east coast area will be that the generation and supply in bulk of electricity may well pass from the municipalities, and that the north-east coast group of companies will be left to continue their operations either on their own account or as lessees from the District Board.

The municipalities further direct attention to the inequitable character, so far as regards municipal electrical enterprises, of the financial proposals of the report. It is apparently proposed that the generating stations and distribution systems of municipalities shall be taken over by the District Electricity Boards, on terms

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which imply no more than the bare discharge of outstanding loans by means of terminable annuities.

The basis of compensation proposed by the report will act unfairly as between municipalities and companies, and will have the effect of penalising those undertakers who have set up adequate reserve funds and maintained their undertakings in an efficient manner, and of favouring those undertakings which have distributed an undue proportion of their surplus revenues amongst shareholders, or in reduction of rates.

It is submitted that if Electricity Boards are to be constituted to take over existing electrical undertakings, the terms of transfer of municipally and commercially owned generating stations and distributing systems should proceed upon the same basis, and that whatever terms are given to the one should be given to the other.

Again, the municipalities object to the recommendation of the Electric Power Supply Committee's report that whereas commercial distributors are to continue to exercise the right of paying dividends subject only to the limitations of a sliding scale of charges to consumers, municipalities who continue to distribute electricity are to be permitted either to make no profit at all or only a nominal profit.

Furthermore, the municipalities take strong exception to the proposal that District Electricity Boards or their lessees should be empowered to supply high-tension electricity in the areas of municipal distributors of electricity, and it is contended that, with the possible exception of electricity used by railway companies for traction purposes, there should be for each local area of supply a single distributor of electricity regardless of the question whether the energy supplied is low-tension or high-tension electricity.

Finally, it is manifestly inequitable that power supply companies should, to the exclusion of municipalities, have conferred upon them, as is proposed by the Electric Power Supply Committee's report, the right of supplying electricity for lighting purposes in places where there is at the time no lighting supply.

The municipalities do not concur in the proposals of the Electric Power Supply Committee's report that a preferential basis of rating should be accorded to electricity transmission mains, and that the existing restrictions as to the use of overhead lines should be removed. With respect to the former, the municipalities, not only as owners of electrical undertakings, but in respect of their tramways, main sewers, and other assets, have borne in the past their proportion of local rates, and they see no reason why differential treatment should be extended to electricity transmission mains to the exclusion of other analogous rateable hereditaments. As regards the latter, while in rural areas, and as a temporary expedient, the use of overhead lines for the transmission of electrical energy may be, in special circumstances, desirable and even necessary, a general concession of this character in urban areas is to be deprecated.

The municipalities observe with satisfaction that the Electric Power Supply Committee's report recommends that in the national interest generating stations and main transmission lines ought, as a general rule, to be publicly owned, and they submit that the District Electricity Boards should in all cases be so constituted as to be wholly independent of the influence or control of commercially-owned electrical enterprises. To secure this object it is strongly urged that the District Electricity Boards should consist of representatives of local authorities and large consumers, to the exclusion of companies generating electricity.

In conclusion, the municipalities view with the gravest misgivings the manifest dangers presented by the recommendations of the reports of the establishment in the north-east coast area of an electrical "trust" exercising with Parliamentary sanction paramount powers in that area with respect to the production and supply in bulk of electricity. They therefore most earnestly request that before any proposals are submitted to Parliament, based upon the reports, His Majesty's Government will institute a complete and exhaustive inquiry, by some competent and independent authority, in order that accurate data may be forthcoming as to the statements and findings contained in the reports, and that no affirmative action be taken until an adequate opportunity has been afforded to the municipalities of presenting their views before an unbiassed and impartial Committee of Parliament.

ELECTRICITY NOW AND AFTER THE WAR.

VIEWS OF THE TRAMWAYS AND LIGHT RAILWAYS ASSOCIATION.

Important correspondence has passed between the Institution of Electrical Engineers and the Tramways and Light Railways Association in regard to the reports of the Board of Trade Committees on (*a*) electric power supply and (*b*) electrical trades after the war.

The secretary of the Institution (Mr. P. F. Rowell) writes:—

"A meeting of the committee appointed by the Institution to report on the above was held at the Institution Offices on Monday, July 29, at which there were present representatives of the Institution of Electrical Engineers, the Incorporated Association of Electric Power Companies, the Provincial Electric Supply Committee of the United Kingdom, the Municipal Tramways Association, the British Electrical Federation, Edmundson's Electricity Corporation, the British Electrical and Allied Manufacturers' Association, the Cable Makers' Association.

"After discussion the meeting was unanimously of opinion that in view of the fact that interested associations are at the present moment considering the above reports and preparing their comments thereon for submission to the Board of Trade, it would be extremely desirable, in order to avoid overlapping and to secure unanimity as far as obtainable, to ask each association to defer sending their comments to the Board of Trade at this stage, but to send such comments to the Institution Committee.

"It is proposed that all comments that may be received by the committee in this way shall be analysed and compared with a view to bringing them into line as far as possible, the intention being that eventually after such further consultation with the various associations as may be necessary one single representation, consisting of two sections, shall be made by the Institution to the Board of Trade. The first section would consist of unanimous recommendations, and the second section would consist of recommendations made by one or more associations, in which case it would be clearly indicated which associations support the respective recommendation.

"The committee feel strongly that a single representation of the kind indicated, made by the Institution after consultation with the various associations represented, would carry far greater weight with the Government than a number of recommendations from individual associations made without any attempt at co-ordination and in the nature of things inevitably at complete variance with each other.

"Should your association agree to the request of the committee I should be glad to receive their comments at the earliest possible date, as the committee feel that it is extremely desirable that the representations from the Institution to the Board of Trade should be made while the Bill is in progress of being drafted, rather than put in after the Bill has been drafted.

"In order to facilitate the co-ordination of the various comments received it is suggested that as far as possible the comments of each association should be sub-divided under the following headings:—(*a*) Technical, (*b*) financial, (*c*) personal, (*d*) users."

In reply, the secretary of the association (Mr. A. de Turckheim) writes:—

"I am instructed by the Council of the Tramways and Light Railways Association to transmit for the information of your committee their observations on the recently issued reports of the Electric Power Supply Committee and the Electrical Trades Committee appointed by the Board of Trade. In forwarding these observations I am desired to point out that they should be regarded as a first contribution to the deliberations of your committee and not as the finally considered decision of this association on the many important matters dealt with in the two reports.

"1. Electrical energy is the motive power used, with very few exceptions, by all tramways and light railways in the United Kingdom. According to the last Board of Trade Return (1913-14) the annual consumption amounted to 629,862,019 B.T. units. Allowing for additional services and increased loading since that date, it may be estimated that the number of units used last year by tramways and light railways amounted to some 750 millions. According to Garcke's Manual the total number of units sold last year for all purposes amounted to 2,366 millions. Tramways and light railways therefore utilised last year nearly one third of the total quantity of electrical energy produced in this country.

"2. A number of tramway and light railway undertakings derive their supply of energy from their own stations, providing only for the traction supply, but by far the greater number of undertakers purchase the energy they require or supply themselves from a general supply station which they own and operate.

"3. The Council believe that tramways and light railways undertakers owning purely traction stations fully appreciate the economic and other advantages of the combination of all classes of electricity supply, and would be willing to dispose of their stations subject to receiving adequate compensation for the expenditure they have incurred both on the stations and the main feeders and to receiving an undertaking that they will be supplied with electricity at least as cheaply from another source. The terms of purchase recommended in the report of the Committee on Electric Power Supply cannot be equitably applied to tramway power stations. The addition of a tramway load to a general supply has a beneficial effect on the cost of production of the latter, and this should be taken into consideration in the event of a sale.

"4. The Departmental Committee on Electrical Trades deal in Clauses 34 and 35 with some of the more important disabilities under which electric tramways suffer, namely, recurring periods of purchase, the incidence of the burden of road repairs, periodic revision of fares, settlement of rating questions and running powers. The Committee expressed the view that unless there be a complete revision of the present powers the development and growth of tramways and light railways will continue to be impeded. The Council fully endorse this view, and strongly urge that the revision

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of the Tramways Act, 1870, and the Light Railways Acts should be one of the first matters pressed on the attention of the Government.

"5. Both Committees in their reports refer to the bad effect of compulsory purchase, especially when the power to purchase may be exercised at short recurring intervals. The Tramways Act, 1870, unfortunately created a precedent in regard to terms of purchase, which have since become notorious under the name of 'tramway terms,' and have been made applicable, with some modifications, to Electricity Supply Acts and Orders. Tramway terms of purchase tend, as the date of purchase approaches, to retard the development of any business to which they apply. Parliament has perpetuated this, the worst feature of these terms of purchase, by permitting after the first long period has elapsed, the exercise of the same condition of purchase at short recurring intervals, thus putting a stop to the development and improvement of the undertaking which are essential to efficiency. The revision of tramway and electricity supply legislation in regard to terms, and especially to periods of purchase, is, in the opinion of my Council, imperative, not only for the well-being of the industry, but also in the interests of the public.

"6. The Council supports the views expressed in both reports that a permanent body of Commissioners, consisting of men of ability and high standing, should be constituted, to whom all questions concerning electricity supply and electric traction should be submitted.

"7. The Commissioners should advise the Government of the day on all matters appertaining to the electrical industry, and should be authorised to consider and enquire into all applications for new powers and the revision of existing powers. They should be placed in a position to envisage the whole field and to base their recommendations on broad national lines. To enable them to advise without being unduly bound by precedents my Council recommend that they should, in the first place, be appointed by the Minister of Reconstruction, and should report to Parliament through him. The Council are of opinion that the Commissioners should, at any rate at first, be empowered to act only in an advisory capacity.

"8. Tramway and light railway undertakers are not so vitally affected as electricity supply undertakers by the various proposals contained in the reports for the generation and distribution of electricity by District Electricity Boards and others. A reliable and adequate supply of energy at a cheap rate is to them of the first importance, and any scheme which will ensure this end will meet with the full support of the association

FINANCIAL REPORTS AND MEETINGS.

DONCASTER CORPORATION TRAMWAYS show a surplus on the working for the last financial year of £3,838, as compared with £2,083 in the previous year.

YORKSHIRE (WEST RIDING) ELECTRIC TRAMWAYS COMPANY.—A final dividend of 3 per cent., being at the rate of 6 per cent. per annum, on the 6 per cent. cumulative preference shares is announced.

BRIGHTON TRAMWAY ESTIMATES.—The profits of the Brighton Corporation Tramways for the current financial year are estimated at less than £10,000 as compared with £15,428 last year. The profits from the electricity undertaking are also expected to show a decline.

AUCKLAND ELECTRIC TRAMWAYS COMPANY, in the report for the year ended June 30 last, states that the total revenue was £301,435. Traffic receipts amounted to £294,564, an increase of £11,867. After providing for all expenses there is a surplus on the year's working of £53,430; £5,293 was brought forward, making £58,723. The directors recommend that £10,000 be transferred to reserve account (making £152,500), and that a further dividend be paid on the ordinary shares of 1s. per share, less income tax, for the half year ended June 30, making 1s. 6d. per share for the year, and £5,973 be carried forward.

NATIONALISATION OF RAILWAYS.—Shareholders are exhibiting no alarm at the prospective nationalisation of the railways. The news should in fact be rather comforting than disquieting. It cannot be doubted that the Government will treat the owners with fairness, when the details come to be worked out. The Railway Act of 1844 gives the Government power to acquire all railways constructed after that date, but on the basis of twenty-five years' purchase of the annual divisable profits estimated on the average of the three years preceding the date of purchase. The price is to be determined by arbitration, and no doubt consideration would be given to cases where the undertaking has not yet fructified.

NEWCASTLE CORPORATION TRAMWAYS.—At a meeting of the committee under the presidency of Councillor Richard Mayne, the accounts for the year 1917-18 were submitted for consideration. The traffic receipts, together with revenue from other sources, amounted to £418,028, against £356,534 for the previous twelve months. The gross expenditure was £248,394, as compared with £208,299. The gross profit was £169,634, against £148,235; and the net profit £90,785, against £62,902. After allocating £14,000 in relief of the rates and making provision for the payment of income tax and insurances, £55,000 had been applied to the reserve and renewals fund, bringing that up to £155,251, against £105,894 for the preceding year.

LUTON TRAMWAYS.—The revenue accounts of the tramways lessees from April 1, 1913, to January 31, 1918, have been submitted to the Luton Corporation, who have requested the town clerk to inform Messrs. Balfour, Beatty and Company, Limited, the lessees, that the Council have for a long time been dissatisfied with the condition and working of the undertaking, especially (*a*) the track (which in many places is in a dangerous state); (*b*) the overhead equipment; (*c*) the cars and their mechanism; (*d*) the inefficient and unpunctual services on some routes; (*e*) the inattention of the drivers and conductors to passengers and would-be passengers. The lessees were given notice to promptly provide and maintain an efficient service, and to execute by not later than June 30, 1919, all such works, repairs, and renewals as are necessary to comply with the terms of the lease as to maintenance and repair.

PROVINCIAL TRAMWAYS COMPANY, LIMITED.—The report for the year ended September 30, 1918, signed by Mr. J. Barber Glenn, managing director and secretary, states that the net revenue received from the local companies amounted to £59,054, compared with £49,720 last year and £52,288 in 1916. After carrying to reserve and depreciation account £12,000, adding to the reserve account for third party insurance, excess profit duty, etc., the sum of £5,000, and carrying £15,000 to the reserve account for deferred repairs, there is a balance of £16,108. A dividend is to be paid on the ordinary shares of 10d. per share and a bonus of 6d., equal to 1s. 4d. per share, making, with 8d. per share paid in June last, 2s. per share, a dividend at the rate of 10 per cent. for the year ending September 30. The balance dividend and the bonus on the ordinary shares will absorb £8,304, leaving £7,804 to be carried forward. The excess profit duty for 1917 and 1918 will be adjusted during the current year.

CAPE ELECTRIC TRAMWAYS.—Mr. Ludwig Breitmeyer, presiding at the meeting of the Cape Electric Tramways recently, referred to the recovery in the traffic receipts which was steadily continuing, and was a most satisfactory feature. During the year under review the number of passengers carried on the Cape Town and Port Elizabeth systems was 25,444,465, an increase of 2,692,449. The receipts were £264,137, an increase of £33,032. Both passengers and receipts constituted a record. The working expenditure was, higher owing to the cost of labour and the prices of supplies and materials. The ratio of expenses to receipts at 61·16 was, however, very little higher than last year. The profits earned showed a surplus of £3,420. Some increases in fares had been put in force toward the end of the past financial year. There was a profit of £88,512, and after deducting interest and sinking fund on debentures, the net profit was £39,800. Including £2,591 brought forward from last year there was an available sum of £42,391. Of this amount £12,000 had been set aside to reserve. A dividend of 5 per cent. would absorb £24,561, leaving a balance of £5,830 to be carried forward.

PRESTON CORPORATION TRAMWAYS.—The report for the year ending March 31 shows a total revenue of £63,497, which, after deducting working expenses and war service allowances, £43,492, gives gross profit of £20,005, which, less chargeable items, leaves a net surplus of £4,158. This amount added to balance from previous year gives £10,069, of which £2,831 is allocated to capital outlay and £5,500 to the relief of the rates, being a balance on revenue account of £1,738. The increase in the revenue was £5,722, and the increase in passengers was from 13,809,189 to 15,455,163. There was an increase in working expenses amounting to £7,599, due principally to war bonuses and the constant advance in price of materials used for repairs. The expenses for the years 1916-17 and 1917-18 respectively were:—Traffic £15,317, £18,232; general £5,429, £7,030; repairs and maintenance £8,345, £11,063; power £5,733, £6,098. The sum of £1,066 has been paid to dependants and employees on war service. Statistics for the years 1916-17 and 1917-18 respectively include: traffic revenue £57,349, £62,783; total revenue £57,775, £63,497; working expenses £34,825, £42,425; sinking fund £5,862, £6,947; contribution to rates £3,750, £5,500; car mileage 1,140,019; 1,113,517; passengers carried 13,809,189, 15,455,163; working expenses per car-mile 7·33d., 9·14d.; power cost per car-mile 1·207d., 1·314d. The tramways serve a population estimated at 120,000.

UNITED STATES ELECTRIC RAILWAY WAR BOARD.

In a recent report of the War Board a list of thirty-eight bulletins, which were issued for the information of electric railway companies throughout the United States, is included. The bulletins deal with a great variety of subjects, such as coal conservation, skip-stops, electric railway war utilities, return load bureaus, etc. Street railway companies throughout the country have been very active in assisting the Government in every possible way.

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PERSONAL.

Councillor Rudd has been appointed chairman of St. Helens Corporation Tramways Committee.

Mr. F. W. Bricknell, city engineer of Hull, has been granted an increase in salary of £250, to £1,000.

Mr. Clifford C. Paterson joins the General Electric Company, Limited, as Director of Research Laboratories, as from January.

Sir Auckland Geddes, President of the Local Government Board, has become vice-president of the London Safety First Council.

Mr. George Balfour, managing director of Messrs. Balfour, Beatty, the Coalition candidate for Hampstead, was elected by a majority of nearly 10,000.

Sir John Snell has been appointed by the Board of Trade to act as their adviser on all matters arising out of the report of the Electrical Power Supply Committee.

Mr. Cecil Leigh, F.I.C., chief chemist of the Birmingham Metal and Munitions Company, Limited, has been appointed general manager of Thermit, Limited.

Private Williamson, Seaforth Highlanders, who has been awarded the Military Medal, was prior to enlisting a car driver in the employment of the Dundee, Broughty Ferry, and District Tramways.

Mr. Richard Mayne, chairman of the Newcastle Corporation Tramways Committee, is deputy Lord Mayor for the present year. The vice-chairman, Councillor M. Sutherland, is Lord Mayor.

Mr. A. E. McKenzie, deputy chief engineer of the Manchester Corporation Electricity Department, has resigned his position, and will join the staff of Messrs. C. P. Sparks, consulting engineers, of London.

Sir John A. F. Aspinall, who has been general manager of the Lancashire and Yorkshire Railway Company for the past 20 years, is retiring at the end of the year, and will be appointed a director of the company.

Mr. H. Pilling, general manager, Accrington Corporation Tramways, has been granted an increase of salary from £400 to £500 per annum, subject to his undertaking not to seek another appointment for two years.

Mr. W. MacGibbon has been appointed manager of the Mexborough and Swinton Tramways Company. He has been manager of the Dewsbury and Ossett Corporation and Soothill Nether Urban District Council Tramways.

Mr. Evan Parry has resigned the position of chief government electrician of New Zealand to accept the appointment of engineer-in-chief of the English Electric Manufacturing Company, particulars of which are given elsewhere in this issue.

Superintendent A. E. Bassom, of the Public Carriage Department of the Metropolitan Police, was one of the twenty-four police officers in England who were awarded the King's Police Medal among the recipients of honours announced on New Year's Day.

Bombadier W. Simmons, R.G.A., who has been awarded the Military Medal for bravery in the field, was a motorman in the employ of Burnley Corporation Tramways when he enlisted in October, 1914. He went to the front in November, 1916.

Mr. Rees Jeffreys has resigned the secretaryship of the Road Board to accept the position of financial adviser to the Motor Union Insurance Company, Limited, of which he was one of the founders and original directors. He has also been elected chairman of the Federated British Insurance Company, Limited.

Sir George Gibb has, it is stated, resigned the salaried post of chairman of the Road Board, which he has held since its formation in 1910. He is, it is added, accepting the position of consulting general manager of the North Eastern Railway, of which he was solicitor for many years and general manager from 1891 until 1906.

Mr. W. J. Steele, city engineer of Newcastle, has been granted an increase in salary from £1,000 to £1,200. A recommendation for an increase in his salary was proposed in 1914, but owing to the outbreak of war the city engineer thought the time was not then opportune and at his request the proposal was withdrawn. Mr. Steele has been serving abroad for some time.

Councillor J. Teago, of the Newcastle-upon-Tyne Corporation, has been presented with a silver tea service for Mrs. Teago, in recognition of his work as an auxiliary tramway driver during the early days of the war. In making the presentation, Councillor R. Mayne (chairman of the Tramways Committee) said that Newcastle was the first town to introduce auxiliary tramway workers, and during 18 months Councillor Teago had turned out at 4 o'clock in the morning to drive the workmen to the shipyards and factories in the city. Councillor Teago suitably replied on behalf of his wife.

Mr. A. A. Blackburn, chief engineer to the Belfast Corporation Tramways, has resigned his position on his appointment as general manager of the Huddersfield Tramways. The Belfast Tramways Committee have accepted the resignation with regret, and have expressed their appreciation of the manner in which Mr. Blackburn has discharged his duties since his appointment on the reconstruction of the tramway system in 1905, and their best wishes for his future welfare in his new position. Belfast Tramways Committee have placed on record their appreciation of the efficient and reliable manner in which Mr. Blackburn has discharged his duties during his 14 years' service in Belfast.

The New Managership at Bury.—Bury Tramways Committee interviewed four applicants, out of 42, for the position of manager of the Bury Corporation Tramways. The selected candidates were Messrs. C. J. Baker, traffic manager, Blackpool Corporation Tramways; H. Beetson, chief clerk, Bury Corporation Tramways; Frank Buckley, general manager, Wigan Corporation Tramways; and A. B. Hayes, depot superintendent, Bury Tramways. On December 23 the Committee appointed Mr. Buckley to fill the vacancy, subject to confirmation by the Council. Mr. Buckley has been at Wigan for six years, and has reorganised the tramways there under circumstances of great difficulty. He was formerly assistant to the general manager at Salford.

Mr. R. H. Wilkinson, the late tramways manager of the Huddersfield Corporation, who has recently been appointed to a similar position at Bradford, has received a presentation from the chief officials of the Corporation as a token of their goodwill and esteem. The Town Clerk (Mr. J. H. Field), in making the presentation, which took the form of a handsome silver tray, referred to the cordial relations which had always existed between Mr. Wilkinson and his brother officials, and to the great extension and improvement in the position of the Huddersfield tramways undertaking during the 14 years that Mr. Wilkinson has been manager and engineer. He had no doubt that the same success would attend Mr. Wilkinson's service under the Bradford Corporation. Other principal officials tendered congratulations, and Mr. Wilkinson suitably responded.

Mr. William Clough was entertained to dinner by the Executive Council of the Municipal Tramways Association at the Municipal and County Club on December 19. Mr. T. B. Goodyer, president of the Municipal Tramways Association, presided, and Sir J. W. Courtis, vice-president of the Association, and Mr. J. B. Hamilton, chairman of the Executive Council, were amongst those present. Mr. Clough recently resigned the positions of general manager of the Bury Corporation Tramways and honorary secretary of the Municipal Tramways Association in order to accept an appointment with an important paper manufacturing syndicate. Eloquent testimony was given by the chairman and others of the high regard and esteem which Mr. Clough has won from his colleagues, and the thanks of the Council were expressed for his services to the Association, together with cordial good wishes for success in his new position.

We deeply regret to record the death of **Mr. Cecil Bickersteth,** of Messrs. Robert Kearsley and Company, which occurred on December 2, after a short illness, a severe attack of influenza developing into pneumonia. Mr. Bickersteth was a member of the Tramways and Light Railways Association, and was greatly esteemed by many friends in the tramway industry, who deplore his early death.

CONTRACTS AND ORDERS.

Walsall Corporation have accepted a tender for varnishes from Docker Brothers, Limited.

Cumberland Engineering Company have an order from Walthamstow Council for two sets of apparatus for dealing with tube corrosion.

Salford Tramways Committee have accepted a tender for 54 British steel tires from Cammell Laird and Company, Limited, at £339 12s.

The British Electric Vehicles, Limited, are supplying a 20-cwt. electric truck fitted with ironclad exide battery to Hull Corporation for the collection of street sweepings.

East Ham Corporation have been recommended to accept the tender of the Shrewsbury and Challiner Tyre Company, Limited, for repairing two wheels of a motor fire engine.

Electric Vehicles for Taunton.—The Town Council propose to apply to the Local Government Board for sanction to a loan of £4,500 for the purchase of three electric vehicles.

London and Brighton Electrification.—The General Purposes Committee of the Brighton Corporation have sent a resolution to the general manager of the London, Brighton and South Coast Railway, strongly expressing the opinion that the main line between London and Brighton should be electrified at the earliest possible moment.

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TRAMWAY AND LIGHT RAILWAY NOTES.

BARROW-IN-FURNESS.

PROPOSED MUNICIPALISATION OF THE TRAMWAYS.

Barrow-in-Furness Corporation are considering the question of taking over the tramway undertaking, which is one of those associated with the British Electric Traction Company, Limited. A decision will have to be reached within the next six months, or the opportunity of purchase will not occur for another seven years.

BLACKBURN.

LATER CARS.

The Tramways Committee have extended the running of the cars from 10 p.m. till 10.30 p.m. For some months the service has been stopped at 10 o'clock, and there have been recently strong protests at the cars leaving the centre of the town so early.

BATH.

AGREEMENT FOR INCREASED FARES.

A committee of the Corporation has received a letter from the manager of the Bath Electric Tramways accepting the terms of the draft agreement providing for an increase in fares and asking that the period in which the increase should be charged might extend beyond the six months named, if the circumstances justified it, as long as the Board of Trade might direct. It was to be understood that the agreement did not preclude the company from asking for a further increase in fares if it became necessary.

BELFAST.

APPLICATION FOR SERVICE MEN—INFLUENZA VISITATION—CAR MAINTENANCE.

Belfast Tramways Committee have resolved to apply to the military authorities for the release of all employees who are at present serving with the colours. Councillor Turner, chairman of the Tramways Committee, recently told the Council that during the past few weeks there has been the greatest difficulty in maintaining the ordinary service. Early in December, there were 127 men down with influenza and there had been several deaths. At a meeting of the Council some weeks ago, Councillor Duff alleged that car repair work was twice as costly as at Glasgow. At the last meeting Councillor Turner said that Mr. Duff had quoted wrong figures in regard to the number of cars at Belfast. Instead of 190 they had 290 cars, and considering the number of cars the cost of general maintenance and repairs in Belfast was almost the same as at Glasgow. Before councillors attempt to criticise managers, it would be an advantage, and a saving of time, if they would take the pains to verify the information.

BIRMINGHAM.

A COURAGEOUS MOTORMAN.

At a meeting of the Tramways Committee, the Lord Mayor (Alderman Sir David Brooks) presented motorman Jesse Robinson with a guinea, awarded him by the committee for specially courageous conduct in stopping a runaway horse in Aston Road. About two years ago Robinson received similar recognition for his prompt action in stopping his car, and thereby saving the life of a child.

BRADFORD.

ELECTRIC WELDING OF JOINTS—PARCEL TRAFFIC.

In the annual report of the Corporation Tramways, it is stated that a contract has been entered into with the Rail Welding Company to repair 200 hammered rail joints as an experiment by the "quasi-arc" system of electric welding. A number of joints have been repaired and the contract has been further extended. Fishplates were welded to the rail and the running surface of the rail, which was hammered out near the joint, was re-treaded. The work was carried out at night after the car service had been discontinued, and it has resulted in a great improvement in the permanent way. The income for the last financial year from parcel traffic on the Corporation Tramways showed a substantial advance, due largely to increased rates and munitions traffic; but owing to increased expenditure the surplus was only £718. The total number of parcels carried was 598,902, compared with 644,064 the previous year. The department is divided into two sections, viz., parcels and motor haulage. The earnings per parcel averaged 3·804d., and the cost 3·721d., leaving a profit of ·083d. per parcel.

CARDIFF.

NEED FOR "SAFETY FIRST" TEACHING.

While absolving the driver from responsibility in regard to the death of a four-year-old child, who was knocked down by a tramway car, the Cardiff Coroner expressed the view that instructions should be given to drivers that, when there was an element of danger such as this—a little child, who did not know what danger was, standing in the road, although apparently safe—it was imperative that they should pull up.

DUDLEY.

THE COMPANY TO PROVIDE SHELTERS.

The associated companies owning the tramways at Dudley have agreed to provide several shelters on the line of route subject to the Corporation lighting, maintaining, and policing them. The Streets Committee of the Corporation have recommended the acceptance of the terms.

GLASGOW.

FEWER CARS AND INCREASED RECEIPTS—BADGE FOR 25 YEARS' SERVICE.

In spite of the restricted car service the tramway receipts are being well maintained, the income for the week ended December 7 being £28,343 against £27,627 for the previous week, and £26,641 for the corresponding week a year ago. Mr. Dalrymple, the general manager, stated that there is little hope of an immediate return to the normal service. With the coal supplies slowly diminishing, there is indeed a prospect of further curtailment. The Tramways Committee propose to grant a special badge to all employees who have continued in the service of the department for 25 years.

LIVERPOOL.

RE-ARRANGEMENT OF THE OFFICES—FEWER STOPS AND REDUCED ENERGY CONSUMPTION.

Liverpool Tramways and Electric Power and Lighting Committee now meet at the well-appointed head offices, Hatton Garden, where a spacious room has been provided for the meetings of the committee, which will in future regularly take place there. The change has the advantage of concentrating everything relating to the undertaking under one roof, where all the records will be kept. The whole scheme includes a reference library, which when completed will afford each member of the committee an opportunity of posting himself on matters relating to the undertaking. Cordial recognition was given to the general manager, Mr. C. W. Mallins, for his efforts in arranging for the excellent accommodation.

LONDON.

UNIONS WITHDRAW FROM CONCILIATION BOARD—COUNTY COUNCIL TRAMWAY MATTERS—ARMISTICE PAYMENT TO EMPLOYEES.

As the result of the two unions catering for tramway employees having joined the National Transport Workers' Federation, the Traffic Conciliation Board of the London County Council is likely to be non-effective. It has been reported to the Council that the employees' representatives had tendered their resignations, and that although the usual steps were taken under the conciliation scheme to secure nominations, none were received. The Highways Committee state that the Board can be fully constituted whenever the employees so desire. The Board was inaugurated under the Board of Trade scheme, and it is the only organisation of the kind dealing with the grievances of the road traction employees. During its few years' existence it secured many valuable concessions. In view of the labour problems confronting tramway authorities, and of the need for frequent conferences of the Municipal Tramways Association, the County Council recently appointed Messrs. G. H. Hume, A. H. Scott, and W. J. Squires to represent them at such conferences until December 31, 1918, and Messrs. G. H. Hume and A. H. Scott as from January 1, 1919, until further orders, together with the general manager of the tramways. In view of the work of tramway operation being carried on under abnormal conditions at the conclusion of the armistice, the Council granted the operative staff an allowance of a day's pay, entailing an expenditure of £5,211.

MANCHESTER.

PASSENGERS STANDING UP BEFORE STOPS.

A recent decision of Mr. Justice Bailhache at the Manchester Assizes that "a person who gets up in a tramcar before it stops does so at his or her own risk," has caused a great deal of discussion. Councillor Ross Clyne has given notice that he will move that a public pronouncement be forthwith made by the Tramways Committee bearing upon the decision. The case was one in which a passenger claimed damages for injuries through being thrown into the roadway when the car went over points.

NEWPORT.

AN INSTITUTE FOR TRAMWAY EMPLOYEES.

A new institute for the tramway employees of the Corporation has been opened by the Mayor (Councillor Parfitt). There was a parade of the employees, headed by their band—accompanied by contingents of tramway employees from Cardiff and Pontypridd. Among the speakers at the ceremony were Sir John Courtis (chairman of Cardiff Tramways Committee), Mr. Arthur Ellis (tramways manager, Cardiff), and Councillor John Moxon (chairman of the Newport Tramways Committee). Mr. A. J. Attwell (secretary of the Tramways and Vehicle Workers' Union) and Mrs. Attwell were presented, the former with a watch and chain and the latter with an umbrella. Councillor Moxon announced that if the institute was well conducted the Corporation would increase its contribution by £300. Sir John Courtis thanked Newport for giving the lead to Cardiff and other towns in this matter.

NOTTINGHAM.

RESULT OF FEWER STOPPING PLACES.

Mr. R. H. Swain, chairman of the Nottingham Tramways Committee, in answer to a question at the Council meeting, said that the reduction in the number of stopping places had adversely affected the revenue of the tramway undertaking, but it had effected a saving in electric current.

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ST. HELENS.

QUESTION OF EXTENDING THE COMPANY'S LEASE.

St. Helens Tramways Committee have declined to extend the tramway lease, which lapses in October next, and have recommended the Corporation to work the tramways themselves.

SHEFFIELD.

NEW CAR DEPOT AT CROOKES—SHELTER FOR PASSENGERS—PASSES FOR BLIND PERSONS.

The Tramway Committee are proceeding with the erection of a new car depot at Crookes. A shelter is to be erected at the junction of Town Lane and Fulwell Road. Sunday morning munition workers' cars have been withdrawn, and free passes are to be issued to blind persons. A grant of £20 has been made to Sheffield Military Hospital fund, and £200 to the West Riding and Sheffield District Rifle Association. Double pay has been granted to the traffic employees for time worked on armistice day.

DEMANDS FOR SHORTER WORKING HOURS.

TRAMWAY MEN'S 44 HOUR WEEK.

The National Transport Workers' Federation have forwarded to the Municipal Tramways Association and the Tramways and Light Railways Association, covering respectively the municipally and privately owned tramways in the United Kingdom, the following list of demands:—

(1) That the working week shall consist of 44 hours, inclusive of signing on and signing off.

(2) That every employee shall be guaranteed a working week of 44 hours or payment equivalent thereto.

(3) No day's work shall be in excess of eight hours.

(4) In no circumstances shall a reduction in the working day entail a reduction in existing wages.

(5) No spread-over duty shall exceed nine hours, inclusive of meal times or relief.

(6) All national holidays, Sunday, and overtime labour to be paid for at the rate of time and a half.

(7) All employees shall be granted 14 days' holiday annually with pay.

A meeting of representatives of the tramway companies connected with the Tramways and Light Railways Association was held on January 3, at Caxton Hall, to consider the demands put forward by the National Transport Workers' Federation, which were given in our issue of December 28. These demands include, among other concessions, a 44 hour week for tramway employees. A committee was appointed to confer with the committee which it was expected would be appointed at a meeting in Manchester of representatives of the municipal tramways on January 10. The joint committee it is anticipated will later confer with representatives of the National Transport Workers' Federation, with the object of arriving at some basis of agreement.

It is estimated that these demands, owing to the great additions to the number of employees necessary, would mean an average increase in working expenses of more than 25 per cent. In many towns the increase would be greater than this and the burden would be more than the industry could bear.

PORTSMOUTH TRAMWAY RECONSTRUCTION.

Mr. W. R. Spaven, general manager of Portsmouth Corporation Tramways, has submitted to the Mayor, Mr. John Timpson, who is also chairman of the tramways committee, a memorandum dealing with the necessary reconstruction and extension of the tramway system. The memorandum states that a very large amount of work will have to be taken in hand, so soon as arrangements can be made. Mr. Spaven says:—

"The returns for this year show an increase over the pre-war year (1914) of about 14,000,000 passengers, which works out at 17·7 per car-mile. To deal with this traffic we have 100 cars, and during last summer we had an average of 92 cars in daily service, leaving the small margin of eight for general overhauling purposes, and the carrying out of ordinary running repairs, which clearly shows that our present rolling stock is altogether inadequate to meet the traffic demands.

"If this traffic is maintained, and I see no reason why it should not be so, and in view of what may take place in Portsmouth during the coming summer, and as there is no possibility of obtaining any additional new cars for some time to come, we shall be faced with a very serious traffic problem, and the only solution of the same is, in my opinion, for the committee to consider the advisability of obtaining, if possible, some motor omnibuses, which could be run from outlying districts to the centre of the town, through thoroughfares quite clear of the tramway route.

"These omnibuses would also be useful when the reconstruction of the track is taken in hand for conveying people when the car services are disorganised."

The schedule of work that Mr. Spaven recommends should be taken in hand at the earliest practical moment is as follows:—

Repairs and Renewals.—Permanent way, overhead equipment, cars.

New Work.—Cars (top roof covers and vestibules); car shed; converting some of the old cars into the toast-rack type; extension of tramways—(*a*) Milton and Hilsea; (*b*) through Chichester Road, linking up London Road and Copnor Road; (*c*) through St. Michael's Road, linking up main line and Floating Bridge line with Park Road section; alterations at the Town Hall and other parts for dealing with the traffic; Bradford junction; motor omnibuses.

PATENT LIST.

Abstracted for "The Tramway and Railway World" from the Official Journal of Patents.

***** If the inventions have been communicated the names of the communicators are given in italics.**

APPLICATIONS FOR LETTERS PATENT.

The number of the patent is given in brackets.

Means for starting internal combustion engines of motor cars, etc. (19,365)—A. J. Adams.

Suspension and adjustments of brakes for motor, etc., vehicles (19,450)—Arrol-Johnston, Limited, G. W. A. Brown, and E. G. Grinham.

Change speed gear actuating mechanism and locking devices (19,451)—Arrol-Johnston, Limited, G. W. A. Brown, and E. G. Grinham.

Radiators for engines of motor vehicles (19,555)—G. Clark.

Combined sleepers and chairs for railways (19,511)—S. C. Clayton.

Vehicle wheels (19,482 and 19,483)—Dunlop Rubber Company and C. Macbeth.

Audible and visual indicator for automobile vehicles (19,667)—E. L. Harley.

Variable speed gear (19,406)—J. Nelson.

Transmission mechanism for motor vehicles (19,594 and 19,695)—R. D. Nuttall Company.

Lifting jacks for use on motor vehicles (19,703)—F. L. Rapson.

Springing systems for motor vehicles (19,739)—A. W. Reeves.

Visual and audible electric indicators (19,814)—J. G. Rose.

Foot pedals for motor vehicles (19,566)—F. Le H. Salmon.

Rims for motor vehicles (19,544)—R. H. Shawcross and J. Watson.

Means for locking chair keys or wedges of permanent way (19,762)—O. G. Taylor.

Reinforced concrete sleepers (19,633)—F. G. Wright.

Chassis for motor, etc., vehicles (19,870)—J. Budge.

Body part of motor, etc., vehicles (19,871)—J. Budge.

Leaf springs for suspension of motor vehicles (19,872)—J. Budge.

Lifting jacks for motor vehicles (20,154)—L. C. Burgess.

Electrical equipment of motor vehicles (19,955)—W. A. Cocking and W. E. Hean.

Construction of motor parts of automobile vehicles (20,093)—M. A. Delque (*née* Habans) and C. M. Motte.

Automobile vehicles (20,211)—M. A. Delque (*née* Habans) and C. M. Motte.

Track switches (20,158)—R. Dempster and Sons and W. Hargreaves.

Overhead electric trolleys (20,068)—J. Ford.

Motor vehicles (20,100)—H. C. Gibson.

Automobile, etc., wheels (20,152)—E. F. Goodyear.

Variable speed transmission gear (19,936)—G. C. E. Hampden.

Automatic apparatus for lubricating railway and tramway track wheels and rails (20,179)—A. Hofmann.

Power transmission and variable speed gear mechanism for motor cars (19,965)—F. Hopley.

Variable speed transmission gear (20,007)—W. J. Masser-Horniman and G. Richards.

Overhead electric trollies (20,068)—E. H. Jackson.

Apparatus for testing vacuum brakes on railway trains, etc. (19,899)—E. S. Luard.

Apparatus for testing vacuum ejectors on railway locomotives for brake purposes (19,900)—E. S. Luard and V. P. Rawlings.

Motor vehicles (20,100)—A. W. Marchant.

Motor car bodies (20,341)—W. Matthewman and E. Sandow.

Controlling railway points and signals (20,376)—A. Monard.

Motor vehicles (20,061)—M. R. Moore and H. L. Zeitun.

Brakes for electrically propelled vehicles (20,177)—P. A. H. Mossay.

Electrically propelled trucks, etc. (20,178)—P. A. H. Mossay.

Signal for motor omnibuses and tramway cars (19,968)—R. G. Price.

Automatic couplers for railway, etc., vehicles (19,855)—T. F. Redington.

Means for supporting overhead conductors on railways, tramways, etc. (20,285)—B. J. Rees and E. H. Whittall.

Power transmission gear for motor vehicles (19,932)—F. Warren.

Jacking up or lifting motor vehicles (20,599)—F. W. Baker.

Motor vehicles (20,857)—C. J. Bamford and J. Bamford.

Motor vehicles (20,845)—G. Barker.

Brakes for motor vehicles, etc. (20,659)—G. E. Bradshaw.

Three-wheeled motor vehicles (20,700)—S. Goodwin and Castle Motor Company.

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Portable electric starter for motor car engines (20,713)—C. B. Cave-Browne-Cave.
Construction of bodies of motor vehicles (20,824)—F. M. Charles.
Speed or mileage indicators (20,841)—R. Courty.
Motor vehicles (20,510)—C. W. Fulton.
Motor car bodies (20,511 and 20,512)—C. W. Fulton.
Automobile wheels (20,808)—E. F. Goodyear.
Railway signalling systems (20,557)—T. J. Hornblower and MacKenzie, Holland and Westinghouse Power Signal Company.
Wind screens for motor vehicles (20,517)—G. Purvis-Russell-Balfour Kinnear.
Steering and control mechanism for motor vehicles (20,454)—F. W. Lanchester.
Speed indicators (20,829)—O. D. Lucas and H. P. Martin.
Direction indicating or signalling system for motor vehicles (20,776)—A. McLeod.
Means for presenting directions to drivers of mechanically propelled vehicles (20,670)—R. A. Miles.
Controlling railway points and signals (20,451)—A. Monard.
Motor car power transmission system (20,467)—H. R. Morgan.
Trolley heads for electric traction (20,619)—J. B. Parker and J. Smith.
Apparatus for operating railway points, etc. (20,881)—A. C. Rose and Saxby and Farmer.
Automatic signals (20,892)—E. G. Shane.
Electrically driven vehicles (20,411)—J. E. Stott.
Detachable rotary splash guard for motor omnibuses, etc. (20,438)—G. Tydeman.
Starting internal combustion engines on motor vehicles (20,421)—J. Walster and S. Walster.
Points for tramway, railways, etc. (20,950)—E. Allen & Co. and E. Larmuth.
Variable speed transmission gear (21,190)—D. J. W. Baxter and Palladium Autocars, Limited.
Braking motor vehicles (21,414)—M. Birkigt.

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Lubricators for locomotives, etc. (21,461)—J. Bliss.
Speed recorders (21,001)—E. S. Carey.
Direction indicators for vehicles (21,075)—J. N. Casson.
Front axles for motor cars, etc. (21,210)—J. R. Churchill.
Seat for tramway cars, etc. (21,428)—J. Harper.
Apparatus for grinding tramway rails (21,361)—W. L. Lorkin.
Detachable disc wheel for motor cars (20,907)—H. R. Morgan.
Reducing splashing from motor vehicle wheels (20,962)—A. Podmore.
Driving gear of motor cars (21,267)—F. J. Sabel.
Rear axle structures for motor vehicles (21,136)—A. C. Scott.
Operation of motor car gears and brakes by compression on air pressure derived from car main engines (21,447)—S. C. Winfield-Smith.
Front steering axles of motor vehicles (21,203)—W. Starley.
Apparatus for operating points of railways and tramways (21,065)—H. A. Thomson.
Wheel for collecting power from overhead electric wires or cables and wire carrying wheels (21,109)—E. W. Waggett.
Combined lifeguard and shields for front wheels of motor omnibuses, etc. (21,067)—W. J. Wicks.
Permanent way for railways, etc. (21,207)—J. Willey.
Frictional change speed and reversing gear (21,718)—H. B. Barwise.
Motor vehicles (21,910)—Birmingham and Midland Motor Omnibus Company and L. G. W. Shire.
Change speed gears for motor vehicles (21,737)—W. G. Boonzaier.
Hauling gear of vehicles or trailers for tramways (21,536)—G. Cousins and C. Hanks.
Motor-driven vehicles (21,697)—S. G. Crowder.
Wheels for motor vehicles (21,898)—J. T. Faichney.
Traffic signalling devices (21,654)—P. J. Foy.
Construction of motor cars (21,729)—C. W. Harrison.
Change speed and reversing gears (21,661)—A. Huart.
Driving mechanism for motor vehicles (21,801)—E. J. Kane.
Motor vehicles (21,889)—G. W. Mascord.
Reversible variable speed gear (21,584)—J. C. Massier.
Reversing gear (21,882)—V. Mickelsen.
Flange lubricating devices for wheels of railroad cars (21,534)—A. Roth.
Change speed gears (21,513)—G. E. Stanley.

Specifications Published.

1917.

Means for carrying gas upon motor vehicles (15,256—*120,237*)—A. Phillips.
Power transmission mechanism of locomotives, railway motor cars, etc. (15,501—*120,238*)—Baguley Cars, Limited, E. E. Baguley and L. Bentall.
Radiators for motor vehicles (16,285—*111,478*)—H. Jezler.
Railway ties (16,812—*120,278*)—W. C. Halleck.
Brakes for vehicles (14,618—*120,413*)—R. C. Pessell.
Automobile bodies (15,086—*110,554*)—J. A. Anglada.
Sanding devices for motor road vehicles (15,597—*120,415*)—T. de Estrada.
Fluid pressure braking apparatus (16,262—*120,430*)—J. W. Cloud and J. W. Cross.
Construction of electric collectors (17,014—*111,847*)—Soc. Anon. des Etablissements L. Bleriot.
Differential gearing for steering motor vehicles (17,780—*120,468*)—G. M. Blackstone, F. Carter, E. Carter, and R. E. Watts.
Solid rubber tires (11,854—*120,589*)—Dunlop Rubber Company and J. V. Worthington.
Petrol and like motors (16,291—*120,601*)—W. G. Ritchie.
Fluid pressure jacks (17,272—*120,637*)—E. Graham and G. Bowman.
Axles of motor vehicles (17,495—*120,643*)—W. Shepherd and G. H. Gibbs.
Fluid pressure braking apparatus (17,743—*120,652*)—J. W. Cloud.
Electro-magnetic clutches or brakes for the driving and change speed gear of motor road vehicles (16,749—*120,757*)—G. Pollard and Menco-Elma Syndicate.
Means for the support of crank cases, gear cases, etc., in motor vehicles (17,355—*120,780*)—S. E. Alley.
Fore axle for motor vehicles (17,356—*120,781*)—S. E. Alley.
Tramway cars and other passenger vehicles (17,257—*120,953*)—W. S. Laurie.
Radiators for motor vehicles (17,770—*114,821*)—H. Jezler.
Electric speed changing mechanism (17,871—*120,987*)—J. Carlier.
Liquid or other fluid pressure braking apparatus for motor vehicles (17,924—*120,988*)—E. Graham and G. Bowman.

1918.

Starting devices for motor vehicles (2,891—*120,324*)—J. Wilson.
Change speed gear for motor driven vehicles (189—*120,481*)—Daimler Company and T. Dawson.
Wheels for motor vehicles (2,437—*120,498*)—E. A. Vivinus and J. G. Raphael.
Variable speed gear (3,904—*120,506*)—J. Ruscoe and Company and G. H. Kenyon.
Operating mechanism for infinitely variable transmission gearing (14,503—*120,710*)—L. R. Jones.
Rear axle structures for motor vehicles (10,786—*121,089*)—Albion Motor Car Company and T. B. Murray.

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TRAFFIC RETURNS.

Tramway and Omnibus Undertakings in the United Kingdom.

NAME OF COMPANY OR CORPORATION.	1917. WEEKS ENDED.					1918. WEEKS ENDED.					AGGREGATE.		
	Dec. 1.	Dec. 8.	Dec. 16.	Dec. 22.	Dec. 29.	Nov. 30.	Dec. 7.	Dec. 14.	Dec. 21.	Dec. 28.	Wks.	1918.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Aberdare U.D. Council	454	455	452	457	536	499	508	509	531	593	38	19,296	...
Aberdeen Corporation	2,006	2,146	2,022	2,015	2,167	2,393	2,534	2,455	2,505	2,532	30	78,138	+ 13,435
Ayr Corporation	340	331	335	333	354	382	395	425	408	418	32	20,502	+ 4,301
Belfast City	...	...	...	...	...	...	...	...	...	...	—	—	—
Birkenhead Corporation	1,865	1,840	1,835	1,929	1,717	2,141	2,207	2,203	2,258	1,965	39	85,746	+ 13,627
Blackburn Corporation	1,323	1,307	1,298	1,321	1,694	1,488	1,498	1,618	1,670	1,864	39⅞	71,486	+ 12,866
Bradford Corporation	7,242	7,384	7,658	6,858	7,405	8,529	9,122	9,268	9,749	9,090	39	362,072	+ 61,267
Burnley Corporation...	1,809	1,845	1,812	1,807	2,054	2,115	2,221	2,368	2,400	2,690	—	—	—
Burton-on-Trent Corporation ...	331	323	334	375	346	391	405	430	449	430	39	16,110	+ 3,778
Bury Corporation	1,508	1,503	1,384	1,536	1,477	1,792	1,933	1,918	1,916	1,932	39	79,958	+ 15,269
Chatham and District	1,122	1,085	1,080	1,035	1,133	1,167	1,176	1,237	1,259	1,150	52	65,920	+ 340
Cork Electric	545	548	521	525	609	544	544	562	564	600	52	31,510	+ 2,844
Derby Corporation	1,256	1,216	1,158	1,332	1,045	1,361	1,442	1,498	1,556	1,470	39	58,737	+ 11,136
Dundee City	1,526	1,543	1,509	1,492	1,590	1,799	1,908	1,921	1,995	2,004	32	62,037	+ 12,192
East Ham Corporation	1,241	1,246	1,216	1,234	1,260	1,518	1,656	1,634	1,696	1,631	38⅝	61,018	+ 7,121
Glasgow Corporation	27,033	26,643	26,475	26,074	26,830	27,627	28,343	28,666	28,631	28,470	30½	863,917	+ 64,290
Glossop (Urban Elec. Supply Co.)...	165	172	167	159	180	174	194	196	220	210	52	9,428	+ 1,314
Halifax Corporation	2,162	2,220	2,227	1,995	2,398	2,422	2,576	2,716	2,762	3,019	38⅞	109,360	+ 13,909
Halifax Corp. Motor Omnibuses ...	50	49	49	43	56	60	62	65	66	70	38⅞	2,572	+ 679
Huddersfield Corporation	3,118	3,120	3,056	2,962	3,251	3,641	3,588	3,605	3,632	4,430	39	142,568	+ 18,881
Ilford U.D. Council	...	...	...	...	...	...	...	...	...	...	—	—	—
Ipswich Corporation	556	518	555	618	575	568	615	674	727	659	39	29,609	+ 3,124
Isle of Thanet	143	140	144	172	204	255	292	300	332	397	12⅜	3,966	+ 1,840
Kilmarnock Corporation	212	209	204	207	222	260	276	279	273	292	32⅜	8,486	+ 1,931
Lanarkshire	2,808	2,840	2,901	2,738	2,859	3,455	3,329	3,609	3,491	3,474	52	184,390	+ 39,935
Lancashire United	...	...	...	...	...	...	...	...	...	...	—	—	—
Leeds City	11,020	10,908	10,644	10,864	11,535	13,121	13,750	13,874	13,784	14,894	39	526,981	+ 96,458
Leicester Corporation	4,029	3,999	4,068	4,248	3,935	4,600	4,750	5,031	5,060	4,791	—	—	—
Leyton U.D. Council	1,813	1,820	1,746	1,733	1,827	2,290	2,391	2,461	2,599	2,533	39	92,015	+ 18,051
Liverpool Corporation	16,447	16,577	16,860	16,880	15,861	19,159	19,881	20,217	20,565	19,259	51⅛	952,911	−141,079
Llandudno and Colwyn Bay ...	225	214	223	222	270	258	214	288	286	361	4	1,149	+ 220
London County Council	55,386	55,801	54,241	54,571	50,310	66,179	67,646	69,769	71,492	69,139	38⅛	2,537,783	+403,285
Maidstone Corporation	226	220	211	215	263	226	250	261	283	297	38⅛	10,997	+ 1,452
Manchester Corporation	21,044	21,099	20,826	23,305	20,283	25,122	26,272	27,230	27,669	23,313	39	1,015,033	+202,997
Newcastle-on-Tyne Corporation ...	8,206	8,049	8,120	8,011	7,149	8,335	8,775	8,892	8,859	7,840	39	351,697	+ 45,685
New St. Helens and District ...	...	...	...	...	...	...	...	...	...	...	—	—	—
Northampton Corporation	844	809	829	866	912	868	904	942	1,000	1,008	39	33,954	+ 1,056
Nottingham Corporation	4,605	4,531	4,515	4,588	4,563	4,934	5,417	5,555	5,792	5,658	39	222,768	+ 49,432
Oldham Corporation	2,752	2,734	2,517	2,727	2,643	3,121	3,364	3,506	3,497	3,364	40	138,884	+ 25,758
Reading Corporation	1,056	1,052	1,043	1,053	1,038	1,137	1,217	1,262	1,320	1,194	38⅛	50,472	—
Rhondda Tramways	1,553	1,518	1,581	1,544	...	1,820	1,909	1,978	2,003	...	51	91,842	+ 15,136
Rotherham Corporation	1,829	1,880	1,876	1,923	1,742	2,341	2,268	2,265	1,903	2,395	39⅜	92,233	+ 20,395
Sheffield Corporation	12,658	12,519	12,804	12,878	11,100	12,709	13,136	13,034	12,960	11,551	39⅛	531,663	+ 50,127
Southampton Corporation	2,090	2,068	2,039	2,075	1,996	2,347	2,387	2,433	2,489	2,386	38⅜	98,541	+ 18,792
Southend-on-Sea Corporation ...	629	659	610	639	663	1,034	1,042	1,073	1,128	1,140	39	52,300	+ 16,613
South Shields Corporation... ...	937	933	938	997	...	1,026	1,078	1,119	1,108	...	38	43,919	+ 7,719
Sunderland Corporation	1,877	1,849	1,831	2,004	1,858	2,089	2,186	2,284	2,416	2,321	39	84,315	+ 12,285
Swindon Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
Torquay Tramways	646	635	605	631	...	693	737	726	775	...	51	45,682	+ 11,859
Tyneside Tramways and Tramroads	777	786	...	...	...	828	881	...	...	...	23	23,358	+ 2,873
Wallasey Corporation	1,404	1,388	1,432	1,450	1,404	1,581	1,608	1,630	1,912	1,760	38⅜	73,023	+ 10,993
Walsall Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
Walthamstow U.D. Council ...	1,143	1,120	1,107	1,071	1,119	1,295	1,340	1,385	1,494	1,475	39	56,625	+ 8,587
Warrington Corporation	701	694	678	...	...	756	802	814	...	...	37	28,165	+ 7,418
West Ham Corporation	3,633	3,692	3,616	3,636	3,471	4,525	4,680	4,819	5,072	5,068	38⅛	176,957	+ 34,394
Wigan Corporation	...	2,137	2,142	2,106	2,357	...	2,530	2,602	2,605	2,424	39	96,563	+ 15,560

*** A number of undertakings have suspended the issue of traffic returns for the duration of the war.

Colonial and Foreign Tramway Traffic Returns.

NAME OF COMPANY.	1917. WEEKS ENDED.					1918. WEEKS ENDED.					AGGREGATE.		
	Dec. 1.	Dec. 8.	Dec. 16.	Dec. 22.	Dec. 29.	Nov. 30.	Dec. 7.	Dec. 14.	Dec. 21.	Dec. 28.	Wks.	1918.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Anglo-Argentine	54,091	54,898	53,904	54,902	63,998	59,964	63,629	59,081	61,698	68,664	52	2,935,934	+215,317
Calcutta ... ... Rs.	69,214	71,998	71,852	69,569	...	85,849	83,161	80,809	84,177	...	51	31,185,206	+366,012
Madras ... ... Rs.	33,914	(2 weeks)	...	(2 weeks)	46,646	34,527	(2 weeks)	...	(2 weeks)	43,146	52	942,232	+ 94,912
Pernambuco	4,591	4,690	4,655	4,769	5,373	4,793	5,255	5,177	5,235	5,961	52	230,706	+ 26,199

Companies issuing Monthly Statements only.

	1917.						1918.						Wks.	AGGREGATE.	
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		1918.	+ or −.
	£	£	£	£	£	£	£	£	£	£	£	£		£	£
Ballarat & Bendigo	2,563	2,766	3,072	3,546	...	...	2,948	2,996	3,430	3,690	...	...	28	23,520	+ 1,347
Brazilian Trac. Mlrs	7795000	8064000	7925000	8006000	...	...	9465000	9491000	9081000	8052000	...	...	43	85,782,000	+9,346,000
Brisbane	32,720	36,925	31,600	33,580	32,901	...	36,360	42,670	35,400	36,780	39,246	...	47	401,878	+ 40,559
British Columbia	$438,378	454,425	457,709	491,964	525,629	...	413,968	544,339	575,476	580,354	612,893	...	21	2,727,030	+ 358,925
Buenos Ayres L'c'z.	38,063	39,111	33,655	39,067	39,678	40,901	41,145	41,817	41,006	41,843	42,952	50,460	26	259,224	+ 28,748
Burma	26,288	26,714	26,167	28,955	27,760	...	34,848	41,855	30,836	34,848	34,407	...	17	141,946	+ 31,350
Cape Town	16,067	15,480	...	17,128	...	...	18,409	19,055	17,872	13,877	...	...	—	—	—
Carthagena & H. ...	5,763	4,164	4,306	2,805	3,932	4,424	5,491	2,729	2,549	2,525	2,988	2,950	52	46,864	− 2,702
Cordoba	14,343	14,233	...	...	...	...	...	15,734	...	...	...	...	21	79,054	+ 8,740
East India	1,183	1,562	1,512	1,229	871	1,099	1,968	1,975	1,939	2,044	1,947	2,048	21	9,953	+ 3,680
Kalgoorlie	2,713	2,911	...	...	...	...	2,798	3,340	...	...	...	...	34	22,123	+ 1,058
La Plata	3,876	4,075	3,450	3,742	...	...	6,722	4,382	4,999	5,334	...	...	47	56,826	+ 12,469
Lima	37,731	38,424	35,636	...	...	...	45,974	44,711	42,861	...	...	...	39	389,668	+ 67,475
Manaos ...	Rs. 162,157	150,657	...	...	...	...	134,450	132,507	...	...	...	...	34	1,152,686	− 83,959
Manila ...	$ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Monte Video ...	28,597	28,860	29,426	30,153	...	...	31,684	16,937	29,611	33,203	...	...	52	380,276	+ 20,444
Peruvian ...	$975,000	979,430	950,740	1047220	899 680	1101090	987,300	1029610	957,910	1090815	897,090	1057990	26	6,020,715	− 67,555
Port Elizabeth ...	3,544	3,360	...	3,885	...	...	3,395	3,725	3,661	2,751	...	...	—	—	—
Rangoon	4,783	4,788	5,163	5,667	5,358	5,438	6,055	5,760	6,067	6,566	6,611	6,188	52	71,992	+ 11,174
Toronto ...	$954,192	1039819	1023517	1043886	1052000	...	1049936	1070567	1119925	1048478	1071106	...	47	11,716,181	+ 729,183
Winnipeg ...	$242,797	248,457	267,170	301,772	305.881	...	288,155	288,974	285,670	295,005	283.721	...	47	3,252,863	+ 213,466

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Daimler

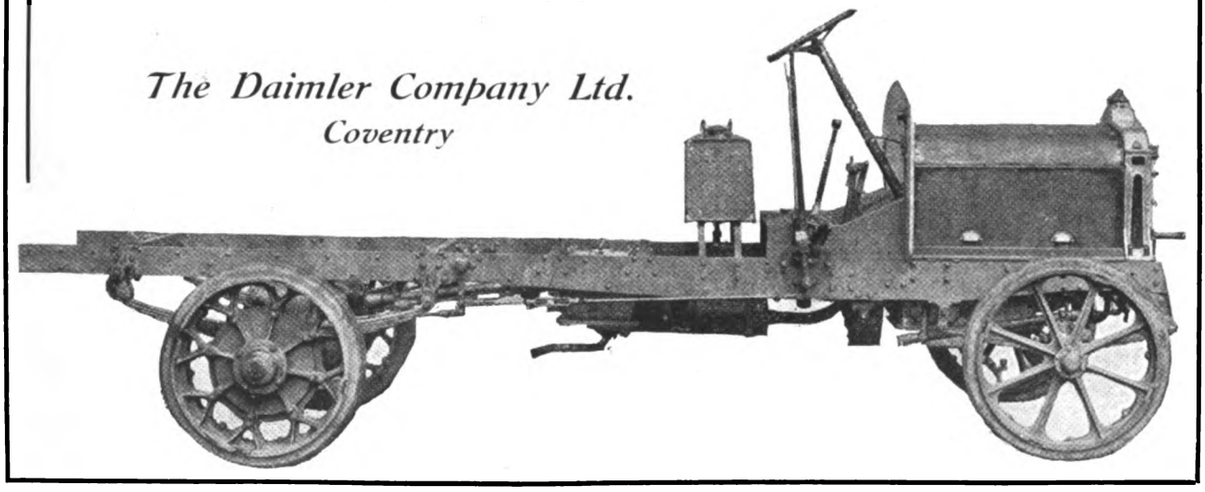
The Daimler Two-Ton Lorry

ONE thing demonstrated during the past four years is the outstanding efficiency of the Daimler Two-Ton Lorry. In all climes, under all conditions, Daimlers have maintained their reputation for reliability, power, simplicity, and economy.

ANOTHER thing demonstrated is the fact that there is no lorry TOO GOOD for a job that must be done regularly, with absolute certainty, and with despatch.

DURING the next few years there will be demonstrated in no uncertain degree the wisdom of regarding Prime Cost as only one factor, and a minor one too, in the estimation of the cost of motor lorry service. The prime cost of a Daimler Lorry covers more than a mere vehicle, it is absolute insurance of maximum efficiency over many years.

The Daimler Company Ltd.
Coventry



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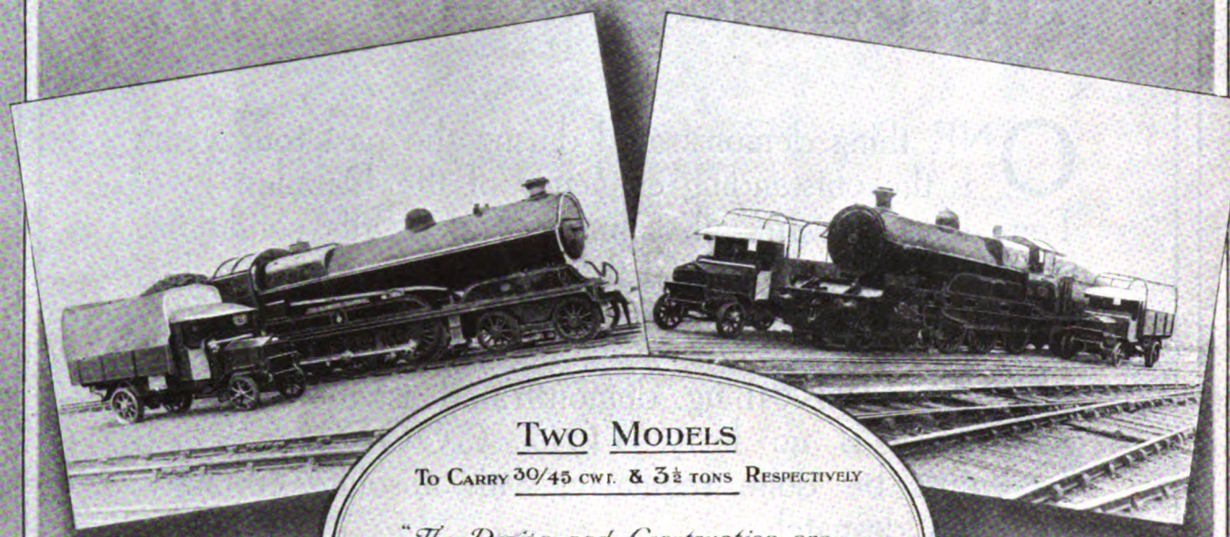
NAPIER

MOTOR VEHICLES.



TWO MODELS

To Carry 30/45 cwt. & 3½ tons Respectively

"The Design and Construction are Throughout of a Character, which it would be Exceedingly Difficult, if not Impossible, to Improve Upon."

RAILWAY GAZETTE. MARCH 31, 1916.

IN PEACE

USED BY THE LARGEST CARRYING COMPANIES AND COMMERCIAL HOUSES.

IN WAR

USED BY THE BRITISH AND ALLIED GOVERNMENTS.

D·NAPIER & SON LTD.

WORKS ACTON, LONDON. W

14, NEW BURLINGTON ST. LONDON. W.

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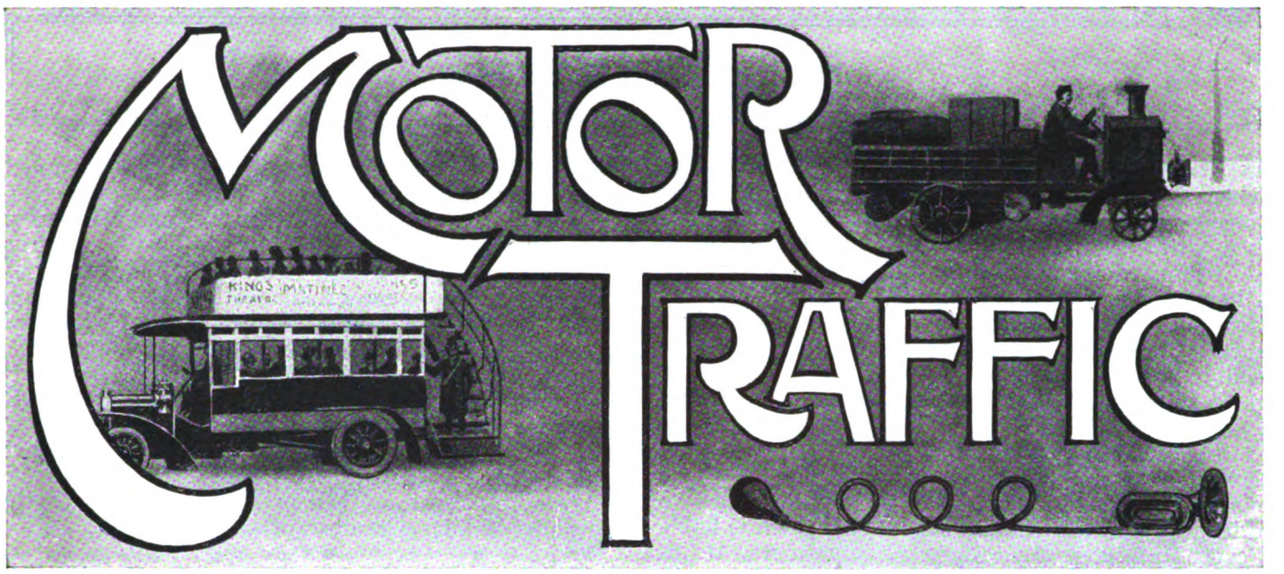

FROM WAR TO PEACE.

The past month has seen a steady and satisfactorily rapid removal of the restrictions occasioned by the war. The position as regards materials is notably better than was generally anticipated, and gives very little, if any, grounds for complaint. Altogether, it is clear that the Government's plans laid during the war with an eye to the period of demobilisation were more advanced than was generally believed. Some time must elapse before normal trading is the order of the day, but in the meantime very considerable numbers of vehicles are available to the general public and the supply will probably not fall far short of the demand in view of the continued difficulties in securing adequate supplies of fuel. In this respect, up to the time of writing, progress has been somewhat slow, and compares unfavourably with the prompt relaxation of restrictions found possible in France. Generally speaking, however, matters are moving so rapidly as to make it undesirable to attempt any criticism in notes which cannot reach the reader until some time has elapsed.

RUBBER TIRES FOR COMMERCIAL VEHICLES

Many amendments to the present Heavy Motor Car Order and Locomotive Acts are suggested in the report, which is summarised elsewhere in this issue, of the expert Committee appointed by the Local Government Board to consider the laws and regulations relating to the construction and use of road locomotives and heavy motor cars in Great Britain. It will be time enough to go into full details when there is an immediate prospect of the recommendations of the Committee becoming law. In the meanwhile we may consider the report primarily as indicating certain broad tendencies and constructional principles which it is clearly desired to encourage. From this point of view the most obvious deduction from the report is that any new law will practically compel the universal use of rubber tires on all heavy motor cars. In the first place we have the proposal that no metal tired vehicle shall be allowed to travel at anything above five miles an hour. Any such regulation would lead to the complete abolition of the use of metal-tires on 3-ton steam wagons. Then we have a further proposal that rubber-tired vehicles drawing rubber-tired trailers shall be allowed to travel at eight miles an hour. At present the 5-ton steamer is, with the exception of the heavier types of tractor, the only class of heavy motor car on which metal tires are fairly commonly fitted. The 5-ton steamer is admirably fitted to draw a trailer with an additional two or three tons of useful load under any reasonable conditions of road and gradient. Thus the proposed change would differentiate between the rubber-tired and the steel-tired five-tonner to such an extent as to make the latter comparatively a poor economic proposition. Furthermore, we have another suggestion to the effect that the diameter of wheels shall be increased all round. The proposed minimum for a rubber-tired wheel is 2 ft. 6 in. With metal tires, however, it is proposed that the minimum diameter shall be 3 ft. 3 in. for axle weights between four and five tons; 3 ft. 6 in. between five and six tons, and 4 ft. above six tons. This means that the rear axle of a 5-ton lorry must be carried on wheels not less than 4-ft. in diameter unless rubber tires are fitted. Thus we have a series of proposals which, if passed into law, will make the rubber tire universal for practically all vehicles except the tractor.

THE USE OF TRAILERS.

Reference has been made to the proposal with regard to the use of trailers. This represents an important step in the right direction. At present the employment of trailers is definitely discouraged by law. In the course of a day's work we can deal with a bigger aggregate load on a 5-tonner with than without a trailer under most circumstances, provided that we take advantage of the higher speeds permissible if rubber tires are fitted. We would suggest that the new limit proposed, namely, eight miles an hour, might with advantage be raised even a little further so as to amount to a positive encouragement in the use of trailers. Also that the Committee should reconsider their views, which are at present to the effect that no passenger carrying heavy motor should be allowed to draw a trailer either for the carriage of extra passengers or for luggage. A trailer of limited dimensions, used exclusively for the carriage of luggage or other goods, might reasonably be drawn behind a passenger carrying vehicle. Its advantages would be particularly obvious in country services where the motor vehicle is required to act as a general carrier, and where, in many cases, the existence of low bridges and overhanging trees makes it impossible to provide safe accommodation for luggage upon the roof.

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MOTOR TRAFFIC

AXLE WEIGHTS AND OVERHANG.

There is no suggestion that axle weights should be changed. We think that they might be slightly raised with great advantage on the score of economy and without doing any serious injury to the roads. An increase in unladen weights is suggested, but this does not amount to much so long as total laden weight and axle weight remain at the old limits. It is proposed to restrict the over-all length of heavy motor cars to 26 ft., which regulation it appears to us would be fairly harmless but somewhat unnecessary. It is also proposed to limit the overhang behind the rear axle to 7/24ths of the over-all length. On the whole we are inclined to favour this proposal. Excessive overhang gives a distribution of weight which is liable to cause injury to the roads. Furthermore, it increases the danger of driving in traffic and on grease, and often puts very serious stresses upon body work. In these notes we can only direct attention to a few of the numerous points raised by the Local Government Board Report, but we have endeavoured to indicate the directions in which the interests of readers are most likely to be affected one way or another by prospective alterations in the regulations. The report itself should be carefully studied, in order that probable changes in the law may be critically considered, and a body of expert opinion brought to bear on this matter, the importance of which can hardly be over-estimated.

AERIAL DEVELOPMENTS.

The recently published report of the Civil Aerial Transport Committee is the first comprehensive official statement on the subject of a development, and will unquestionably exercise immense influence upon the transport system of the world, and assist materially in the spread of civilisation and in the development of mutual understanding between the inhabitants of all countries. The Committee naturally considered in great detail the whole subject of international law as applied to flying, but the majority of our readers will be more interested in those parts of the report dealing with the early possibilities of aerial transport. A very interesting question is how far the Government must act as a proprietor of aerial services. On the whole, one is inclined to wish that the report could have been more definite on this point, and had supported the view, since expressed by Lord Weir that the State should act in this matter in the capacity of an elder brother, helping in the control and organisation but not endeavouring to establish anything in the nature of a monopoly. Official control is undoubtedly needed in order to prevent wild speculative ventures conducted under conditions of an unnecessary danger. Also the lives of passengers must not be trusted to pilots who are other than fully trained and certified in every way as entirely competent to perform their duties.

* * * * * *

Doubtless the first big development of aerial services will be in connection with the carriage of mails. Passengers will presumably be conveyed on mail routes, but for the time being they will occupy what must be called a secondary position. Private enterprise will at first cater for the conveyance of passengers in search of pleasure and novelty rather than bent upon business, although it will not be long before genuine business services will be instituted between large centres of population. At present there is much preliminary work to be done. The science of meteorology can bear further investigation, and will prove a surer guide now that observations in hostile countries are open to us. Wireless telegraphy and telephony will also need more careful adaptation, and offer scope for many improvements. Means must be devised for marking the positions of landing grounds and aerodromes by day and night, and means found to overcome the great difficulty of aerial navigation through or over fog or mist. Lord Weir mentions five years as the experimental period, after which regular aerial navigation in bad weather should be no more dangerous than present navigation on the sea under similar circumstances.

* * * * * *

For the carriage of goods the aeroplane has natural limitations. It cannot compete in cost per ton mile either with the railway or with the road motor wherever traffic is sufficient to justify the construction of the road or permanent way. It will only be used for general carrying purposes in the early stages of development of new countries, but it will find more general employment for the carriage of very perishable or urgently needed articles. Among these may be mentioned cinematograph films, which are typical of a certain class of product, the commercial value of which may be dependent upon the speed with which it can be provided. In such cases the aeroplane would obviously be favoured. Aerial mail services will carry light parcels as well as mails, and will have many advantages over the ordinary postal service, and also, from a different point of view, over the cable services. The aerial mail will be intermediate between the two, and will possess in a sufficient degree many of the principal advantages of both the established systems.

UNRESTRICTED USE OF MOTOR CARS.

INCREASED PETROL AND BENZOL SUPPLY.

The Board of Trade announce that the Motor Spirit Restriction Orders, the operation of which was suspended until January 10, has been revoked entirely as from that date.

Licences to obtain motor spirit are issued under the Finance Act, 1916, and the licence system must therefore remain in force. As previously announced, however, the Petrol Control Department is prepared to issue licences to new applicants, and to increase the quantities allocated to existing licence holders, and will endeavour as far as possible to meet all reasonable requirements.

Motor vehicles may therefore again be used for any purpose without restriction of distance.

The Petrol Control has advised Mr. F. G. Bristowe, general secretary of the Commercial Motor Users' Association, that motor spirit is now obtainable for motor chars-a-banc, and that this type of vehicle may be used on all routes which are not closed under legislation other than that now lapsing under the Motor Spirit Restriction Order. Motor spirit for motor chars-a-banc is, however, only obtainable under licence. Applications should be sent to the Petrol Control Department, 19, Berkeley Street, W.1.

Considerable quantities of benzol are now available as motor fuel, and the ordinary motor spirit licences can be used to buy benzol as well as petrol. After January 1, the Petrol Control Department will issue special supplementary licences available for benzol only. Stocks of petrol are very low, although they are expected to be normal next month. After January 1, if stocks permit, applications for more petrol will be considered from present licence holders, and applications will also be considered from those who do not hold licences. Holders of supplementary licences for benzol will be able to convert the whole of their allowance into benzol; the quantity of benzol allowed is half as much again as petrol.

Further information from the Controller, Petrol Control Department, 19, Berkeley Street, W.1.

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MOTOR TRAFFIC

STEVENS PETROL-ELECTRIC VEHICLES.

A Machine of Many Uses that has Won Success in War.

The 3-4 ton petrol-electric machines which are now being offered to the public by Stevens Petrol-Electric Vehicles, Limited, of 82, Victoria Street, London, S.W.1, embrace a number of very interesting characteristics. The chassis, which is of the War Office subsidy type, conforms in every way to the requirements of the department, and together with the electrical equipment is standardised throughout. At the invitation of Mr. W. A. Stevens, managing director of the company, a representative of The Tramway and Railway World recently visited the extensive works of Messrs. Dennis Brothers, at Guildford, where the Stevens machines are being constructed. A close inspection was made of the chassis and the component parts, and exhaustive tests to which the machines are subjected before passing out of the factory were witnesssed.

Although hitherto unknown to public users of motor vehicles, the Stevens petrol-electric machines have since the early part of 1917 been doing excellent service for the War Department. Large numbers of them have been in use in various fields of operation, both in this country and on the Continent, and have achieved remarkable successes. Especially is this so with regard to the running of searchlights and electric arc-welding. As the conditions under which those machines have been operated were of the most arduous character, the satisfactory results obtained are very gratifying to the company, for they clearly demonstrate the reliability and durability of both the mechanical and electrical equipment.

The designs of these are the outcome of many years' experience in the design and manufacture of commercial vehicle chassis and electrical transmission equipment. As is generally known, in the Stevens petrol-electric system the place of the gear box and clutch found in the ordinary petrol chassis is taken by an extremely flexible electric transmission, which has the effect of reducing the maximum driving strains between the engine and back axle by at least 50 per cent., while its speed and electrical generating capacity offer a wide range of usefulness, amongst which may be mentioned arc-welding, electric lighting, electric heating, power transmission and battery charging. An important feature in this connection is the fact that

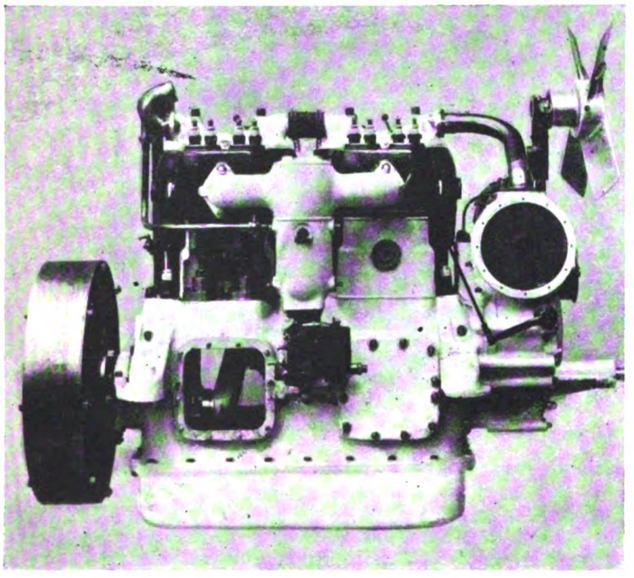

Fig. 1.—Engine.

by means of the Stevens system of control the generator can give a continuous output of 350 or 230 amperes at voltages varying from 60 to 120 respectively, and the characteristic of the machine can be immediately adjusted so that it will be under compound, level compound, or over compound, the latter feature being specially valuable when varying supply at constant voltage at the end of a long cable line is required.

The Stevens "A" type subsidy chassis is specially designed to carry gross loads of four tons. The engine (Fig. 1) has four cylinders, cast in pairs, the bore and stroke being 115 by 150 mm. respectively. The inlet and exhaust are placed on opposite sides, the valves being silently operated and entirely enclosed. The water circulation is maintained by means of a centrifugal pump placed in an accessible position. Accessibility is also a feature of the arrangement of the magneto, oil pump, carburetter, and fan drive. Large inspection doors are arranged in the crank case, the lower half of which can be dismounted without disturbing any of the working parts of the engine.

Ignition is by high-tension waterproof magneto of improved type, so arranged that it can easily be detached for adjustment or replacement. The speed of the engine is definitely controlled by means of a centrifugal governor, adjustable by a hand wheel mounted

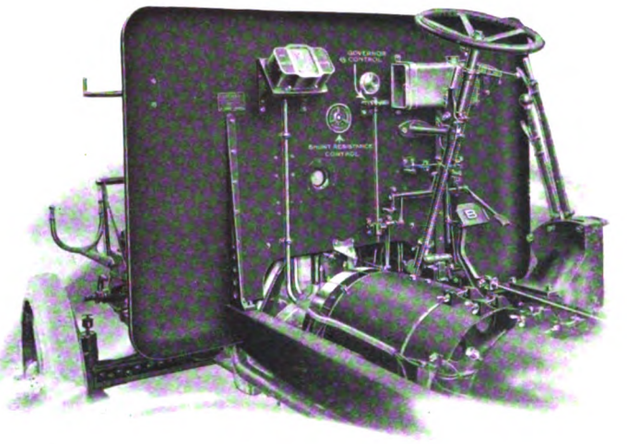

Fig. 2.—View of Dash showing Arrangement of Controls.

upon the dashboard. The carburetter is of the White and Poppe type, and has given very satisfactory results. The petrol tank is fitted at the back of the chassis frame, and has a holding capacity of 30 gallons. The petrol is drawn from the tank by suction to an "Autovac" petrol feed tank fitted to the dashboard under the bonnet, from which it is supplied to the carburetter.

The radiator is of the built-up type, with aluminium headers and vertical copper gilled tubes. It has an exceptionally large capacity, thus enabling the electrical equipment to be run at its full output when the vehicle is stationary. Although the water circulation of the cooling system is maintained by means of a centrifugal pump of large dimensions, the inlet and outlet pipes to the radiator are large enough to allow of thermo-syphon cooling without the assistance of the water pump. The radiator is mounted on rubber-lined trunnions, in order to protect it from road shocks, the portion carrying the tubes being easily dismounted from the top and bottom headers. Adequate protection from damage through collision is provided by means of the usual guard stays and cross tubes of the War Office pattern.

Lubrication of the working parts of the engine is by a combination of forced feed and splash, the oil sump at the bottom of the crank case carrying a supply of oil sufficient for a run of 3,000 miles.

Generator and Electric Motor Specifications.

The electrical equipment consists of a specially-designed generator, driven direct by the petrol engine, an electric motor direct coupled to the cardan shaft, and a reversing and speed-regulating controller of robust construction, bolted to the frame and provided with a weatherproof cover. The generator is of the four-pole interpolar type, compound wound, and provided with commutating poles. It is capable of delivering continuously a direct current of 230 to 350 amperes at a voltage of 120 to 60 respectively at from 1,100 to 1,200 revolutions per minute, or any smaller output within the above limits at a lower speed.

In the construction of the generator the greatest care is taken in the selection of the material and in the workmanship. Thus it will be found that the parts are accurately machined and good magnetic joints ensured throughout. The cover at the commutator end is provided with a sheet metal detachable shield, provided with a fixing device, special means of ventilation being also provided. Skefko radial ball bearings are fitted at the commutator end of the nickel steel shaft, and Hoffmann roller bearings at the other end. Each bearing is lubricated by means of a Stauffer lubricator attached to a brass tube screwed into the bearing cap.

The armature is of the slotted type, built up of stampings of "Lohys" material insulated on one side and provided with ventilating ducts. After winding, the armature is heavily bonded by

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MOTOR TRAFFIC

steel pianoforte wire over a layer of mica. The commutator is built up of hard-drawn copper sectors insulated with pure mica, with steel rings clamping mica insulating end rings, the whole being bolted up under hydraulic pressure.

The brush gear is of substantial construction and heavily insulated. Each brush-holder is fitted with pressure fingers controlled by easily adjusted springs, so that the pressure is uniform throughout the life of the brush. There is a flexible metallic connection between the brush and brush-holder. All windings are thoroughly impregnated by the latest vacuum process.

The specification of the electric motor is identical with that of the generator, with the exception that the field coils are series wound instead of compound wound. The reversing switch and controller are carried in a separate case, and consist of a reversing switch having twelve tramway contact fingers, with screw adjustments, mounted on an insulated base. Upon the latter is carried the drum, heavily insulated from the spindle, and a multiple contact controller for speed regulation. The resistance units, which are easily renewable, are fixed on the base of the controller.

Fig. 3.—Stevens Petrol-Electric Machine—War Office Type.

THE CONTROLS—A CONSTANT VOLTAGE ENSURED.

The control of the vehicle is effected by the throttle pedal of the engine in combination with a speed-regulating controller, the usual foot and side brakes being used The arrangement of the controls is shown in Fig. 2, also in the plan Fig. 4. This shows that the reversing controller has three positions—forward, neutral, and reverse, a safety catch being fitted to the lever to prevent the control being inadvertently moved to the wrong position. The speed-regulating lever, placed upon the left side of steering column, controls the speed of the vehicle by varying the relative excitation of the generator and motor fields, and in effect provides a perfectly gradual speed variation entirely free from shock

In the Stevens petrol-electric transmission the series field of the compound wound generator in series with a multiple contact resistance operated by the hand lever fitted to steering column acts as a variable shunt to the series winding of the electric motor, so that the strengthening of the generator field is accompanied by a corresponding weakening of the motor field and *vice versa*. The shunt current is not varied when driving, although a variable resistance is inserted in series with the shunt fields for use when the vehicle is employed in supplying current for searchlights, electric welding, or other purposes.

The above described form of regulation ensures a practically constant voltage of the generator when the vehicle is running on ordinary roads, and this allows of the supply through a fixed resistance to a 24-volt lighting battery carried on the car, the wiring to lights being on a 3-wire system. This enables standard 12-volt lamps to be used. Where a large supply of electrical energy is required—for example, in advertising—a 60-volt battery can be used.

When the car is used as a mobile generating station for supplying power for searchlights, electric welding, ordinary lighting, battery charging, or power transmission, the adjustable resistance in series with the generator series field winding acts as a variable shunt to the generator fields. By the adjustment of this resistance and the resistance in series with the shunt winding of the generator any desired characteristic can be obtained. The scheme of electrical connections shown in Fig. 5 is as follows :—

DESCRIPTION OF THE ELECTRICAL CONTROL.

The shunt winding of high resistance in series with a multiple contact resistance is connected directly across the brushes of the generator for lighting purposes, and across the brushes of the motor for driving purposes—the change over being effected by the switch L.D.—and is capable of exciting the field to produce the required E.M.F. when no current is being supplied to the outer circuit. From the positive brush of the generator the circuit, after passing through the interpole windings, divides, one circuit being through the series field winding of the generator. This circuit is continued through a variable resistance to the movable contact of the resistance

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device, which in turn is connected to one terminal of the motor field winding. The other circuit is taken to one, say "*b*," of two intermediate terminals, "*a*" and "*b*," of the reversing controller.

The electrical connections of the reversing controller are as follow :—

Carried by, but insulated from, the controller spindle, and from each other, are two plain conducting movable segments, numbered 1 and 2. These are arranged concentrically with and symmetrically to either side of the spindle when the latter is in its mid-position. The segment 1 extends through an angular width of about 210°, and segment 2 through an angular width of about 150°. Mounted on an insulating base or carrier are four stationary contacts, *e*, *f*, *g*, and *h*, of which *e* is connected to terminal *c*, and *f* to terminal *d*. Contact *e* is so arranged that it can make contact with the left-hand side portion of segment 1, and contact *f* is so arranged that it can make contact with the right-hand side portion of the same segment, and contact *g* can make contact with the left-hand side portion of segment 2, and contact *h* can make contact with the right-hand side portion of the said segment 2 by suitable rotation of the segments. The contacts *e* and *g* are arranged in line and at an angular distance of about 180° from contacts *f* and *h*, which are also arranged in line with each other, the contacts being cross connected so that contacts *e* and *h* are electrically connected, as also are contacts *f* and *g*. Segment 1 is flexibly connected to terminal *b*, and segment 2 is flexibly connected to terminal *a*, which is connected to the negative brush of the motor. Terminal *d* is connected to one end of the motor field series winding, and terminal *c* is connected to the other end of such winding and to the movable contact of the resistance device. This device comprises a number of resistances adapted to be successively connected in parallel with one another by movement of the said movable contact in one direction and a short circuiting contact.

When the spindle of the controller is in its mid or neutral position, as shown in B, Fig. 5, segment 1 electrically connects contacts *e* and *f*, but segment 2 does not connect *c* and *d*, as there is an interval of about 15° between its ends and the centre lines of the contacts.

By means of this controller it will be seen that the series field winding of the electric motor is connected across the terminals of the reversing controller, the negative brush of the motor being connected to the intermediate terminal *a*. The circuit from the positive brush of the motor to the negative brush of the generator is made by a low resistance conductor.

The switch connections are such that in the "forward" position of the controller (A, Fig. 5) the series winding of generator with its series resistance forms a variable shunt to the series fields of the motor, and the direction of current through the motor series field winding and armature causes the vehicle to be driven in a forward direction.

The generator series field winding is connected through the variable resistance to the terminal *c* of the motor series field winding. The generator series field winding and the motor series field winding are thus connected in parallel, and when the variable resistance is short circuited, the current through the generator field winding is approximately equal to the current through the motor field winding. By moving the contact of the variable resistance device in a direction to cut out successive parallel resistances in circuit with the generator series field winding, and thus increasing the effective resistance, the current through this winding will be reduced, and the current through the motor field winding will be correspondingly increased.

When the last fixed contact of the variable resistance device has been reached and passed, and the circuit of the generator finally broken, all the current from the generator will pass through the motor series field winding. By the arrangement described a large

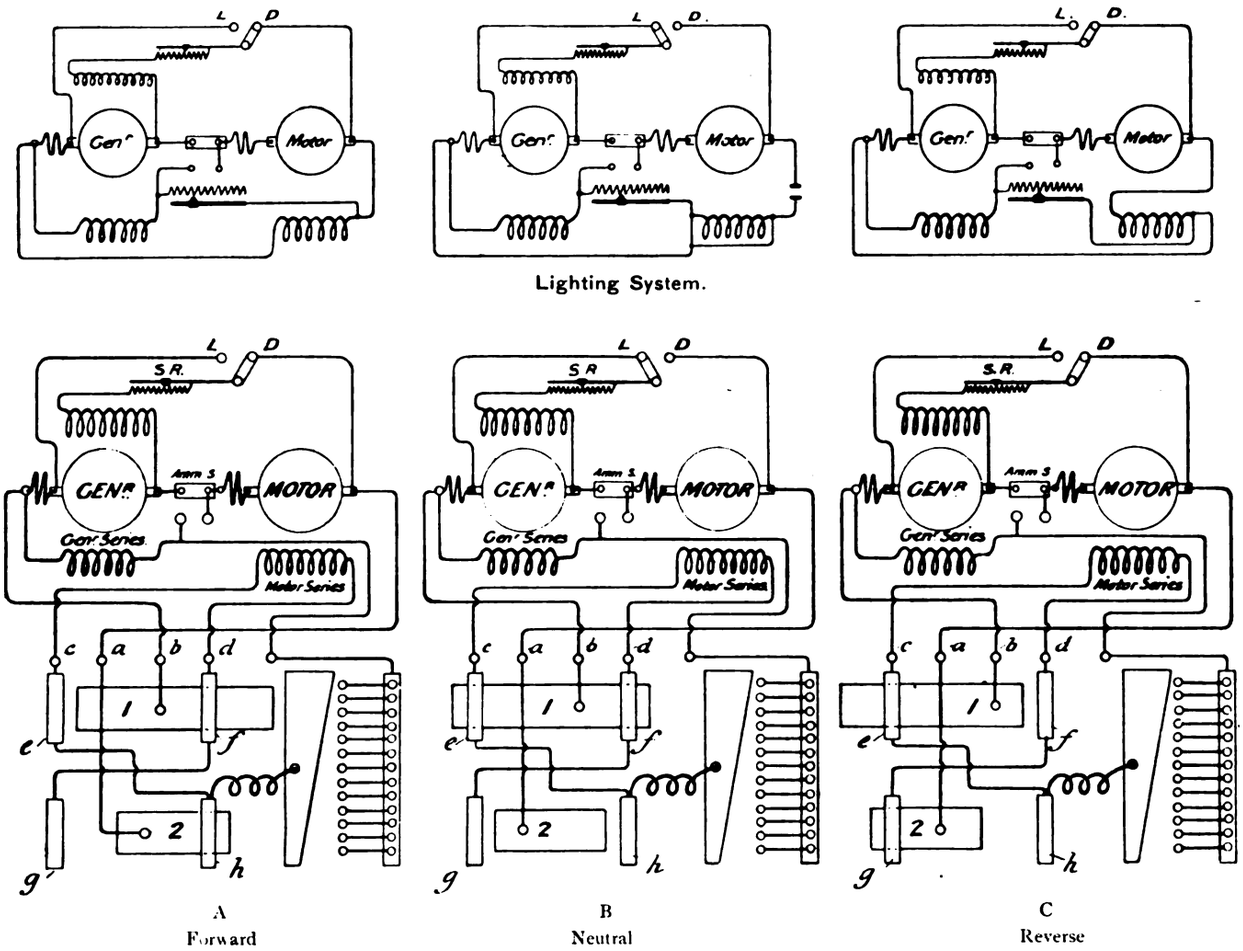

Fig. 5.—Scheme of Electrical Connections.

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MOTOR TRAFFIC

speed variation between the generator and motor is obtained. With the controller put into the reverse position (C, Fig. 5), the generator series field winding is connected in series with the motor series field winding, and is also shunted by a circuit of low resistance. As the resistance of the generator field winding is also low, sufficient current will then pass through the latter winding to well excite the generator, the shunt field winding of generator also assisting. The vehicle will then run in a reverse direction.

To use the electric generator for lighting or welding purposes it is necessary to put the reversing controller into the middle or neutral position (B, Fig. 5). The connection between the motor armature and its series field winding will then be broken, and the motor series field winding and the generator series field winding with the variable resistance will be short circuited. As one of the lighting terminals is connected to the junction of generator and motor armatures, and the other to the junction of the generator series field winding and the variable resistance, this resistance can be made to act as a variable shunt to the generator series winding, so any desired excitation can be attained, and the machine can be used either as an under, level, or over compounded generator at any voltage between 80 and 110.

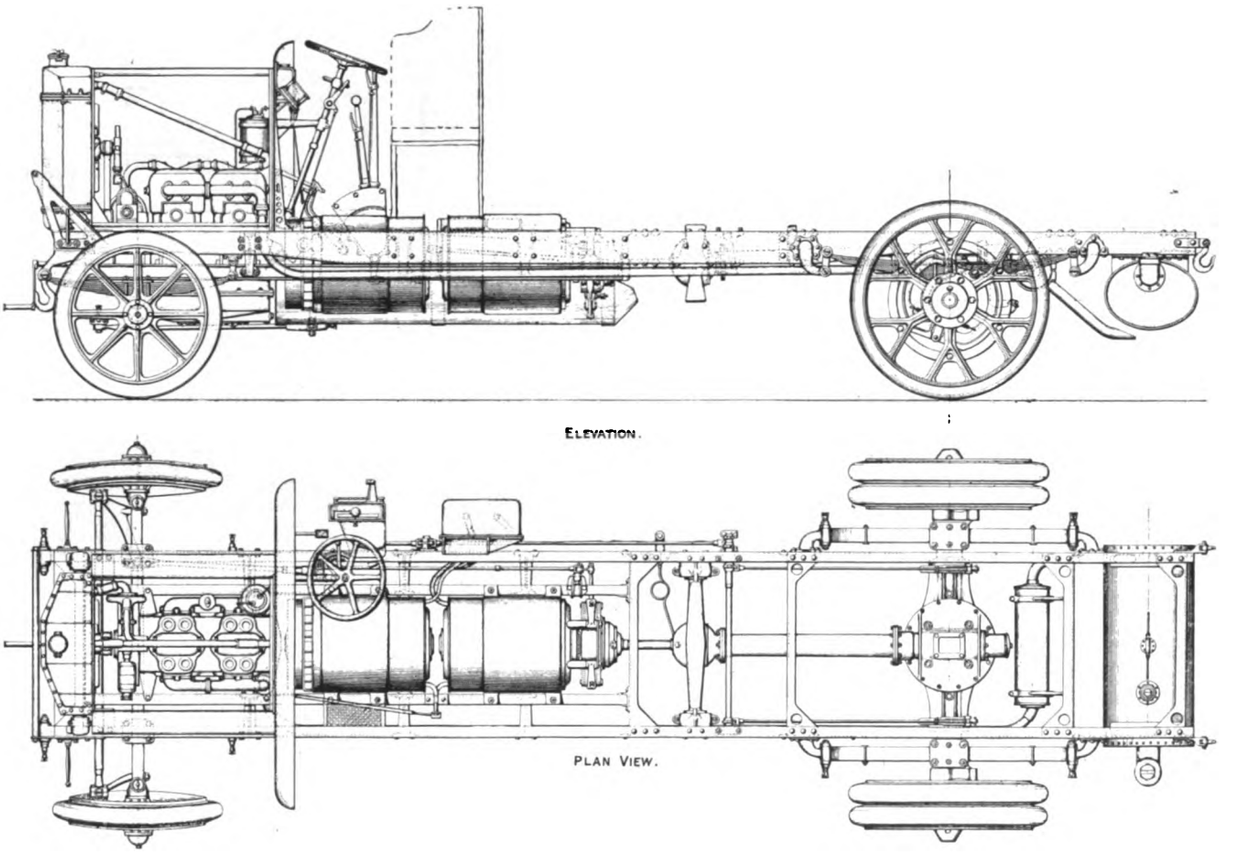

Fig. 6.—Plan and Elevation of Stevens Petrol-Electric Vehicle.

Chassis Features—Withdrawable Live Axle.

A special feature in the design of the chassis, shown in Fig. 6, is the thrust cross member. This is mounted upon rubber-enclosed trunnions, which take all thrust and torque loads, and on that account it is claimed to be much superior to the usual rigid arrangement that allows of no flexibility. The drive is transmitted through a large spherical head, which permits of a perfectly free movement. The torque tube, of large diameter, acts also as a radius rod connecting the ball-head with the rear axle and completely enclosing the propeller shaft. The universal joints between the electric motor shaft and the torque ball are of the ring type, and fitted with bronze bushes of ample size.

Between the engine and generator a flexible coupling is fitted. This is made up of a number of discs of a flexible material, in which rubber enters to a considerable extent. These are cut radially in order that they may be placed in position, the cuts being set at an angle of 120° with each other on the coupling pins. When bolted together, these discs have been found to form an ideal coupling.

A notable feature in the Stevens chassis is the back axle (Figs. 7, 8 and 9). This is the well-known "Dennis" unit, which has earned a well-deserved reputation in all fields of industrial traction. It will be seen the live axle is contained in a steel casing, which carries the weight of the vehicle, the power being transmitted through the specially high efficient worm gearing.

Accessibility is a strong point in the design of this unit. The top cover of the steel casing can be easily removed without taking down the axle. When removed it takes with it the worm, worm gear, and differential gear, while the live axles themselves can be withdrawn without removing the wheels or jacking up the chassis. An oil filler is fitted at the back of the axle casing in an accessible position, so that the oil level can be readily ascertained.

The rear wheels run on hardened and ground bearings fitted with gun-metal floating bushes of the War Office standard pattern. The foot brake is of the contracting type, of large diameter with ample area of wearing surface. It is placed behind the electric motor. The hand brake is of the expanding compensated type, operated by the movement of cams, and is readily adjustable.

The electrical transmission acts as a sprag automatically, and serves effectually to prevent the vehicle from running backwards, except at slow speed, if unexpectedly brought to a standstill without the brakes being applied while negotiating a steep gradient. In this connection it is of interest to note that the test to which subvention vehicles are submitted include the climbing of gradients of one in six fully ladened.

Special attention has been paid to the springing of the Stevens chassis. The springs are well proportioned, and large pins are fitted, while greasers are provided at all points where lubrication is an advantage. Special volute auxiliary springs are fitted to the front axle.

The steering gear is of the Ackermann type, operated by means of a heavy worm and sector, fully enclosed, and giving a large steering lock. The steering connections have spring-loaded ball joints at either end. The front axle is of special section, with ball thrust bearings to the steering heads, allowing of remarkably easy steering.

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MINUTE STANDARDISATION—MOBILE CONSTRUCTIVE SYSTEM.

The chassis frame is of pressed steel of channel section with cross members of the same section. The engine and electrical equipment are carried upon an underframe, the whole being protected from mud and dust by an undershield of non-rusting sheet steel extending from the engine to the rear of the electric motor. A free ground

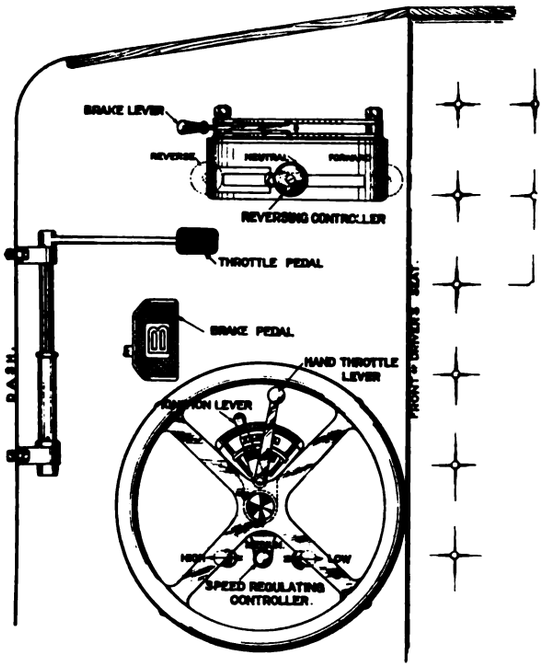
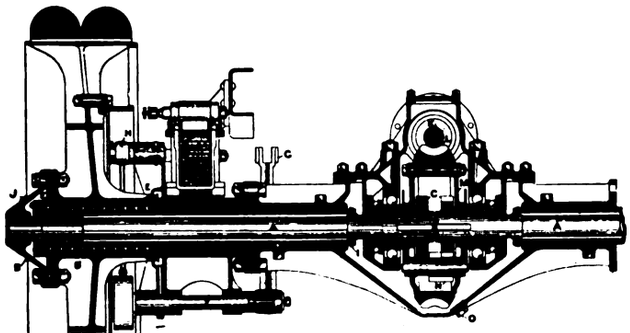


Fig. 4.—Plan of Controls.

clearance of 11½ inches is given, a point of considerable importance in Colonial service.

As already stated, the whole of the possible output of the Stevens vehicles has been hitherto taken by the Ministry of Munitions for the various fighting forces, so that it has been impossible for them to be offered to the public. With the completion of the orders now in hand, however, the company will be in a position to give prompt delivery to intending purchasers. The arrangements for manufacture are such that large numbers can be quickly assembled and



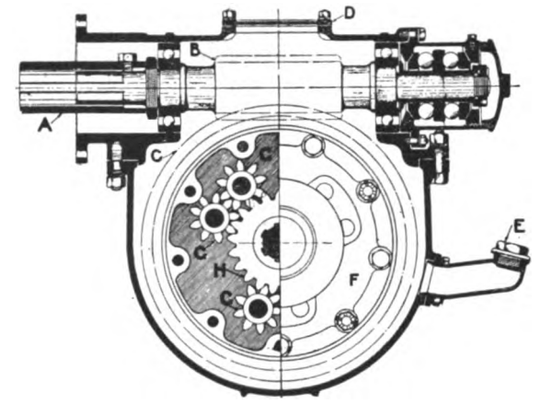
A Live Axle.
B Driving Dog.
C Star Wheels.
D Bronze Floating Bush.
E ,, Thrust Washers.
F Brake Cam Shaft.
G ,, Lever.
H ,, Shoe.
I Oil Retaining Cup Leather.
J Oil Filling Plug.
K Worm Shaft.
L ,, Wheel.
M Differential Case.
N ,, Pinion.
O Oil Draining Plug.

Fig. 7.—Back Axle, General Arrangement.

passed through the exhaustive tests afore-mentioned. All parts being standardised, spares are readily obtainable; even the most minute part has its registered number and figures in the spare part catalogue, which is complete in all details.

A good idea of the method of assembling the Stevens chassis was gathered from our representative's inspection. In one of the bays of the erecting shop were a large number of frames, having been passed from the drilling jigs, where all the holes are drilled by a method which ensures absolute accuracy and greatly facilitates the subsequent erection of the chassis as it passes through the various stages. Many of these frames had their hangers and springs mounted ready to be dropped by the travelling hoist into position upon the axles. A number of generators and motors, together with parts of the equipment, were also assembled here prior to being transferred to the particular spot from which they are placed in position in the chassis.

In a shop of great length and breadth a string of chassis in various conditions of assembly were seen. The wheels having been



A Propeller Shaft Coupling Sleeve.
B Nickel Steel Worm Shaft.
C Bronze Worm Wheel.
D Inspection Cover.
E Oil Filler.
F Differential Case.
G ,, ,, Pinions.
H ,, ,, Wheel.

Fig. 8.—Back Axle showing Differential.

mounted the chassis is moved along the line in easy stages, at each of which one or other of the component parts is placed into position, until finally the completed chassis is moved away under its own power to undergo the tests. In an adjoining shop were a number of such machines, and also one which, having completed the test, had been fitted with the War Office standard body.

In explaining the method of assembling the chassis to our representative, Mr. Stevens referred to the fact that whereas only a few men could work at the same chassis when stationary without interfering with one another, it had been found that by the mobile system a large number could be employed preparing the units of the equip-

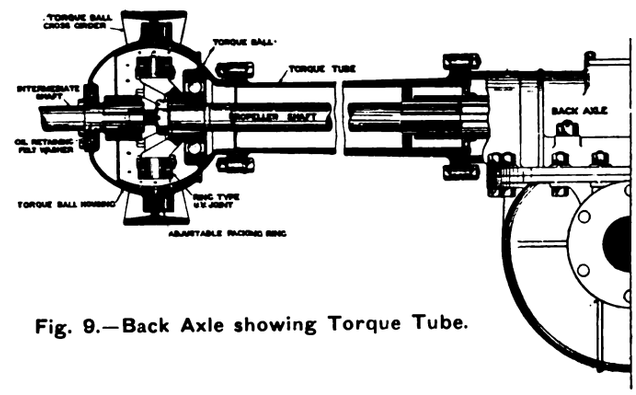


Fig. 9.—Back Axle showing Torque Tube.

ment, and by means of the travelling hoist place them in position in a remarkably short space of time, and so accelerate the output to a very considerable extent. On the occasion of our representative's visit he counted 35 petrol-electric machines in various stages of completion, all of which were destined for the Ministry of Munitions. Judging by the large stock of parts which were to be seen in the capacious store department, however, we shall expect shortly to see the "Stevens" vehicles doing useful work in a variety of public and industrial services.

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MOTOR TRAFFIC

TROLLEYBUS OR MOTORBUS?

CONTRIBUTED BY AN ENGINEER.

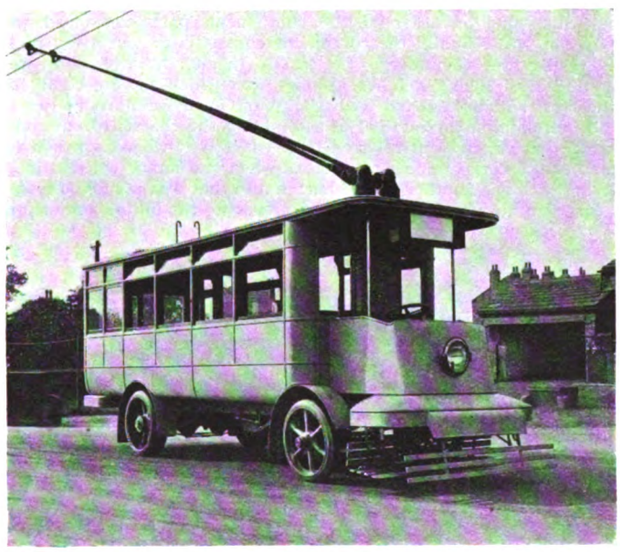
The end of the war quickens into new life all the projected extensions of street traction services and the proposed new installations which have lain dormant for more than four years. Numerous and important as these lines formerly appeared, they constitute but the advance guard of the great array of projects that are now being formulated; for the summons to national reconstruction imposes on all concerned the obligation to survey the traffic requirements of the community with a far wider vision than heretofore, and calls insistently for innumerable additions to our present inadequate communications.

Few new routes were foreseen before the war in terms of rails and tramcars. Capital outlay and maintenance on the one hand, unavoidable interference with and by all other traffic on the other, had already sounded the death-knell of the rail-bound vehicle elsewhere than on the broad main arteries of urban travel and to meet such special conditions as the inter-connection of the tramway systems in adjacent towns. Nor, in the writer's opinion, will the after-effects of the war tend otherwise than to confirm and emphasise the verdict. Furthermore, it is being recognised as better policy to employ cars of moderate seating capacity, and to increase the frequency of service during rush hours, rather than to operate large cars which remain half empty during a great portion of the day

It may therefore be regarded as a foregone conclusion that some form of rail-free vehicle is contemplated for a great majority of the routes which will be equipped for passenger and goods service in the near future. But there is perhaps as yet less general agreement as to the type of rail-free vehicle that will be employed, or in other words as to the motive power by which it will be propelled.

Mechanically-operated rail-free vehicles are a comparatively modern innovation, and owe their existence largely to the development of the internal combustion engine. For this reason a rail-free vehicle and a petrol motorbus or lorry are to many minds almost synonymous terms, and it is apt to be overlooked that the relative merits of rail-bound and rail-free vehicles and the relative merits of various methods of propulsion are two distinct questions.

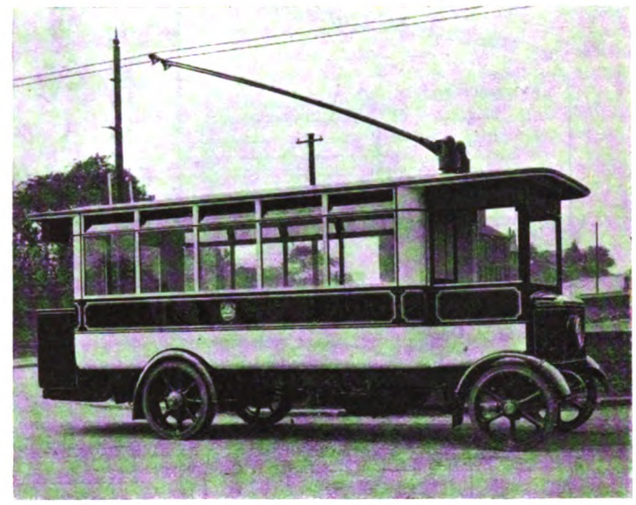
To avoid this confusion of ideas and obtain a clearer conception of the respective advantages of possible alternative methods of



A Trolleybus at Shanghai.

propulsion—electric on the one hand, steam or petrol on the other—it is desirable to consider and analyse the practice of rail-bound traffic, which has been in existence for a far longer time and has not been restricted to only one line of development. It will then at once be observed that the tendency, and to a large extent already the practice, of rail-bound traffic is towards steam propulsion for long and uninterrupted journeys and electric drive for shorter and intermittent services, but that internal combustion engines are nowhere to be found working either express trains or goods trains, or suburban traffic or tramways, or in fact any kind of rail-bound service at all. Even more significant is it that the more nearly the conditions of rail-bound traffic approach those of rail-free services, the more pronounced is the predominance of electricity, which is steadily superseding steam on suburban railways, and has long since ousted every competitor from tramways.

So remarkable a phenomenon is evidently not explicable by minor or secondary considerations, but must be due to some quality



Type of Ramsbottom Trolleybus.

inherent in electric propulsion, which makes it, for intermittent services, notably and indisputably superior to all other known methods. This quality is not far to seek. The essence of satisfactory intermittent service is quick acceleration, and the essence of quick acceleration is the ability to produce and apply instantaneously a tractive effort far in excess of normal running requirements.

This feature is inherent in the combination series motor and central station to a degree unapproached by any other motive power. For whereas the highest rate of acceleration attainable by its nearest competitor, the steam engine, falls far short of the requirements of intermittent passenger service, the only limit to the acceleration of the electrically-propelled vehicle is the physical comfort of its passengers. When, moreover, it is considered that such accelerative power as the steam engine possesses is solely attributable to its large overload capacity and high starting torque, the failure of the internal combustion engine to secure even a footing on rail-bound vehicles appears to be the logical and rational consequence of its having no starting torque and a relatively small overload capacity.

The result of this digression has therefore been to disclose that, for comparable services, the best method of propulsion is universal on rail-bound vehicles, but only the third best on the vast majority of those which are rail-free. It is therefore of interest to investigate the causes which retarded the development of rail-free vehicles propelled by steam or electric power, and enabled the internal combustion engine, in spite of its inherent disabilities, to be first in the field, and thereby to obtain a long lead over its rivals.

The obstacle which has chiefly impeded the progress of steam-driven cars is that steam plant is not easily adapted to the small units and light weights which are essential requirements in rail-free vehicles. Electric propulsion, on the other hand, failed to satisfy an entirely different but equally vital condition—mobility. A motorbus is self-contained, and is therefore perfectly mobile. It can follow any route at will, it can pass and be passed by other traffic to an unlimited extent. But the primitive type of trolleybus was compelled to travel in close proximity to the centre line of the trolley wires, and the privilege of deviating therefrom freely and without risk of unshipping the trolley wheels was obtainable only at the price of excessive and injurious upward pressure on the wires. In a few installations mobility was attained by the use of an over-running trolley, connected to the vehicle by a flexible cable, but this device, long since tried and rejected on tramways, is open to two serious objections—it cannot be adapted to any reliable design of overhead switch or crossing, and it makes it impossible for the trolleybus to be used in conjunction with, and as an adjunct to, existing tramways.

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The lack of mobility from which the trolleybus formerly suffered was overcome by the balanced under-running trolley, which enables the vehicle to deviate at least 15 feet on either side of the centre line of the route without the assistance of any abnormal upward pressure on the trolley wheels, and without giving rise to any tendency for them to leave the wires. Equipped with this device the trolleybus enjoys absolute freedom of manœuvre on any road, it can pass and be passed by other traffic, and it has all the flexibility which distinguishes rail-free vehicles from rail-bound.

It may, indeed, be contended that a trolleybus does not possess that absolute and unqualified mobility which belongs only to a vehicle with self-contained motive power. Unlimited mobility is not, however, a characteristic of material value in public passenger service except in comparatively infrequent and exceptional circumstances. The absence of any physical disability notwithstanding, motorbuses do not in fact career indiscriminately along every accessible road and street. The public service in which they are engaged rivets on them inexorably the time table and the map. They are rail-free indeed, but no more than tramcars are they route-free. From the same considerations it follows that the physical bond which ties the trolleybus to a defined route merely attaches to it a limitation which would in any case be imposed as a primary condition of every organised system of transportation. For the purposes therefore of public passenger service, motorbus and trolleybus are both equally rail-free, both equally route-bound.

Observing, then, that neither type of vehicle has, in respect of mobility, any useful advantage over the other, and bearing in mind that for similar rail-bound services electric propulsion has swept all competitors from its path, it may safely be concluded that the trolleybus with balanced under-running trolley is the type of vehicle best suited to the routes that are now awaiting equipment for passenger service.

To this conclusion experience of existing trolleybus installations lends powerful support, for the advantages which have given electric propulsion its pre-eminent position in intermittent rail-bound traffic have been reproduced in the rail-free model. Accelerative power has enabled a high average speed to be maintained, and in addition the following characteristics have been observed—much lower working costs, more reliable and comfortable service, longer life, greater annual mileage, ability to carry without distress as many passengers as can find standing room, and the power to climb with ease hills which no motorbus could surmount.

Moreover, it has to be borne in mind that the records of the trolleybus are derived as a rule from service under conditions of exceptional severity. Motorbuses achieved their greatest successes on London streets, which on the one hand, with their well-paved surfaces, reduced the cost of maintenance to a minimum, and with their enormous traffic ensured on the other hand a revenue sufficient to cover maximum working expenses. Many a provincial installation has found to its cost that the unique conditions of the metropolis are a wholly illusory basis for estimates of net revenue in other cities. But trolleybus services have from the outset been conducted, and have been financially successful, in provincial districts with populations too small to provide more than a modest revenue, and over road surfaces which make the most searching test of their mechanical strength and durability.

Two instances may be quoted. In one installation, which for several years past has been serving a colliery district and using a rough country road, the cost of maintenance, exclusive of tire renewals, is one penny per car-mile. In the other, trolleybuses, running from 120 to 170 miles daily over indifferent roads and carrying at times 60 and even 70 passengers, are costing no more for maintenance to-day than when first put into commission over seven years ago.

Against the superior economy and reliability of the trolleybus there may be, and often is, urged the capital outlay on trolley wires. This outlay is, however, offset, and in most cases more than offset, by the resultant saving in the cost of motive power alone. For even if the price of petrol reverts to its pre-war basis, it is only under most favourable conditions that motorbuses will be operated at a cost as low as 2½d. or 3d. per car-mile for fuel and lubricating oils. On the other hand, it has been well established that the energy consumed by a trolleybus, including line losses, never exceeds one kilowatt-hour per car-mile, and although the price of electric power varies widely, being anything from ½d. to 1½d. per kilowatt-hour, yet it is easy to see that the saving effected by the trolleybus in this one item alone is never less than 1½d. per car-mile. Now on a route with a service of only one car in each direction every half-hour, a saving of 1½d. per car-mile amounts to no less than £150 per annum per mile of route—a very ample allowance for maintenance and interest charges on the cost of the overhead line. The denser the traffic the more pronounced is the economy of electric motive power, and it is only in the case of very infrequent services that the trolley wires would not pay for themselves.

If, then, all the items contributory to the cost of maintaining a service of trolleybuses or motorbuses are taken into review it is found that

(1) Electric motive power is cheaper than petrol by an amount

A Trolleybus Junction at Bloemfontein.

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which compensates for the extra capital outlay on trolley wires, and leaves a margin of profit dependent on the density of the traffic.

(2) The cost of maintaining and repairing trolleybuses does not exceed a maximum of 1d. per car-mile, whereas the corresponding outlay on motorbuses is never less than twice as much, and is far higher under the conditions of service to which trolleybuses are usually subjected.

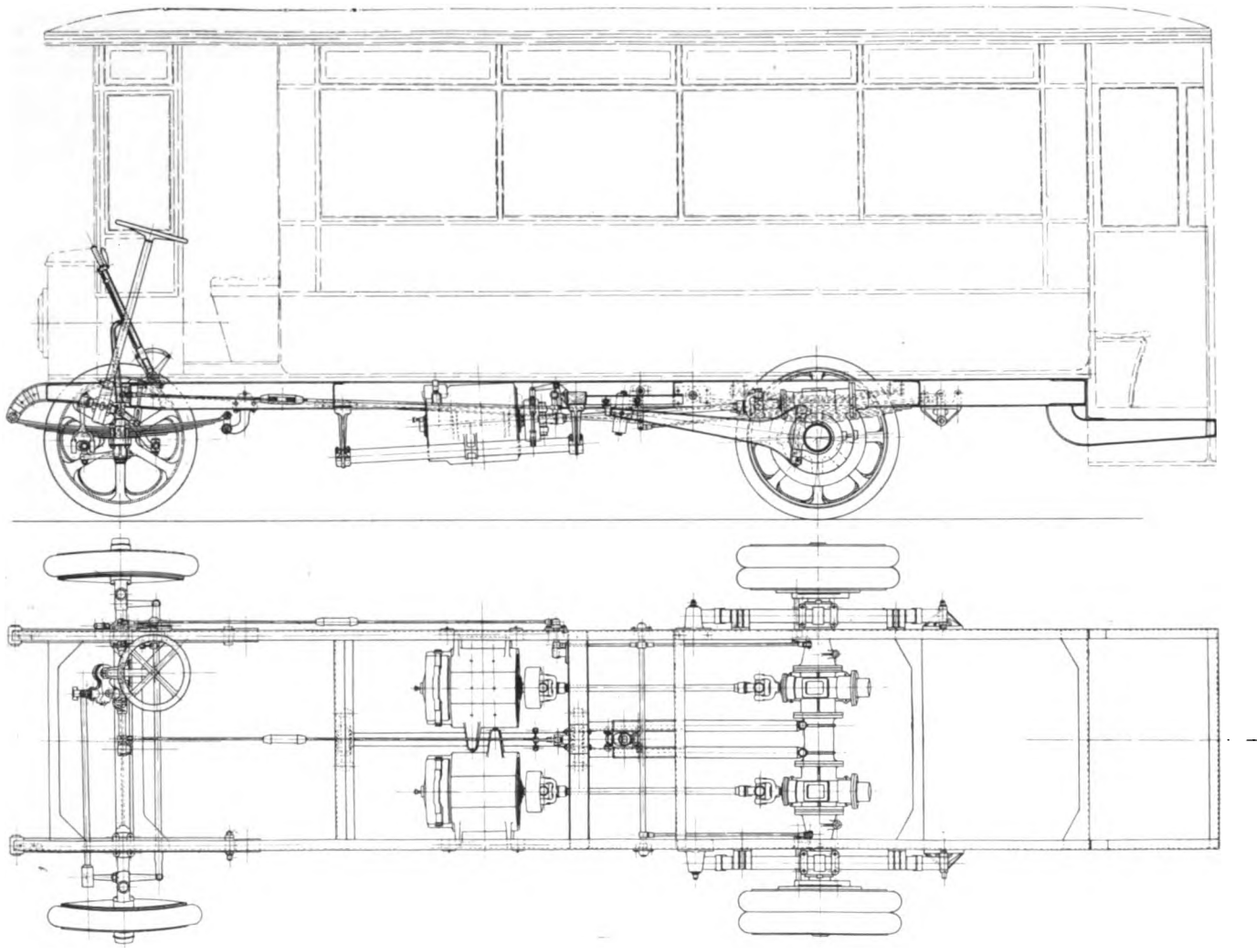
(3) Wages of motormen and conductors and renewal of rubber tires are items of expenditure which are appreciably the same for both systems.

(4) The relative costs of maintaining the two types of vehicle are reflected in the respective rates of depreciation, for whereas a period of five to seven years is the limit of useful life of a motorbus, experience shows that a life of 10 or 15 years is a reasonable expectation for trolleybuses.

When the innate suitability of electric power for traction purposes, and more especially for intermittent street services, is compared with the essential unsuitability of internal combustion engines for any other than continuous and sustained operation under uniform conditions, the degree of perfection to which motorbuses have attained constitutes an unparalleled triumph of engineering skill and persistence over extraordinary difficulties. It does not detract from this remarkable achievement that trolleybuses are enabled, by virtue of their motive power, to exhibit such solid and substantial advantages as would, in the majority of installations, spell the difference between financial success and failure, and that the only valid counterclaim on behalf of motorbuses is that they are able to leave their appointed route and wander into by-ways.

Goods traffic is neither so rigidly route-bound nor so dependent on quick acceleration as passenger service, and although the superiority of electrically driven lorries and tractors may for this reason not be so immediately obvious, yet it is all important from the standpoint of lowest working costs. Inasmuch, then, as economical operation will be an important consideration for all proposed new freight routes, and is to be regarded as the determining factor in agricultural districts, it must be recognised that some of the fundamental and most urgent transportation measures of the reconstruction programme will depend on electric haulage for their realisation.

It may not be out of place to add a few general remarks on the design of electric road vehicles. The notable success that has already attended their use was achieved with designs which included many features more or less standardised in motorbus practice. Some of these features, though indispensable or unavoidable in other mechanically-propelled vehicles, are superfluous in connection with the simpler electric motor drive. It may therefore be anticipated that the electrically-driven rail-free vehicle of the future—the trolleybus designed to take full advantage of the manifold potentialities of electric power—will be as free from the trammels of petrol practice as the motor-car of to-day is from the shadowy equine spectre whose ghostly company haunted the earliest examples of "horseless carriages."



A Trolleybus Chassis.

THE RULE OF THE ROAD.

Lord Montagu of Beaulieu has suggested that the Peace Conference should consider the question of "making the roadways safe for democracy" by instituting a uniform rule of the road for Europe. The suggestion that vehicles in this country should keep to the right (as in most Continental countries) instead of the left side is rendered more important in view of the fact that many accidents to foot passengers would be averted, especially in cases of running down when stepping off the pavement. In Lord Montagu's opinion, an alteration of the rule would also avert considerable delays to tramway cars and omnibuses, due to the ignorance or neglect of the rule of the road. General observance of the rule of the road might avert some costly street widenings.

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OMNIBUSES TO AUGMENT TRAMWAY FACILITIES.

Liverpool Tramways Committee have sanctioned a scheme for assisting the electric tramway service by means of one hundred motor omnibuses. The scheme has been proposed in view of the very heavy demands for passenger transport now experienced in the city. To increase the number of tramway cars is out of the question for a long time, and the situation can be quickly eased by instituting a service of omnibuses. At the meeting of the committee, Alderman E. Russell-Taylor said that during the past four and a half years it had been impossible to obtain new rolling stock or to maintain the old in a thoroughly efficient state of repair, although during the period referred to the city passenger traffic increased by several millions as compared with pre-war years. The existing rolling stock had proved altogether inadequate to meet the extraordinary traffic requirements, the cars being over-crowded from time to time, and the main arteries and terminal points being much congested. It is proposed that the omnibuses shall keep as far as possible from the main tramway thoroughfares, so as to avoid congestion. On certain parts of their journeys they will run at high speed, and journeys will, it is stated, be completed in shorter times than by the electric cars. Numerous routes will be covered and the service is expected to be running in a few months' time.

It is proposed to run motor omnibuses from certain termini of the Portsmouth tramways through various parts of the town and districts not served by the tramways.

The Corporation of Birkenhead have decided to "experiment" with motor omnibuses. It will be recalled that about ten years ago the Corporation, by an action at law, compelled the Mersey Railway Company to withdraw their omnibuses from the streets. Now it is thought that omnibuses will form a useful adjunct to the tramway system.

Stockton Corporation have decided to seek Parliamentary powers to construct tramways from the existing lines in the borough to Port Clarence, to purchase the motor-omnibus undertaking of the Imperial Tramways Company, and to run motor omnibuses in the borough and also to Port Clarence and Greatham Creek.

The Middlesbrough Town Council have decided to promote a Bill with respect to the acquisition, construction, and working of tramways, trolley vehicles, and motor omnibuses.

NO TAX ON BENZOL.

Following representations by the National Council of the Commercial Motor Users' Association, it has been notified by the Board of Customs and Excise that the contemplated imposition of a duty of 6d. a gallon on home-produced benzol, which tax was to have come into force on January 1, is suspended.

The Association, acting in concert with associated transport organisations of employers and labour, are hoping to secure the total withdrawal of the proposed tax on this important home-produced motor fuel.

NATIONAL TRANSPORT.

It has been stated that before the Government went to the country, Sir Eric Geddes was deputed, in consultation with Sir Albert Stanley, to draw up a scheme of national transport services in which a system of State railways would be linked up with canals, motor transport, and aerial and sea services, not necessarily publicly owned. It is rumoured that Sir E. Geddes will be the director of a new department of inland, sea, and overhead transport.

Railway Attitude to Motor Traction.—In speaking recently of the eagerness of organised railway employees to consider the railway nationalisation project of the Government, Mr. C. T. Cramp, president of the National Union of Railwaymen, stated that in his election campaign at Middlesbrough he made a great point of the need to provide good motor roads through the undeveloped parts of the country to assist agriculture and industry, the roads to be supplementary and not competitive with the railways.

Solid Tire Guarantee.—The Macintosh and Challiner solid tires having established a record for accomplishing a mileage in excess of the guarantee of 10,000 miles, the Shrewsbury S.T. and Challiner Tyre Company, Limited, have decided to guarantee Macintosh and Challiner solid tires supplied on and after January 1, 1919, for 12,000 miles, subject to the usual tire guarantee conditions. In the case of steam wagons with trailers attached it may be advisable to point out that the existing guarantee conditions allowing for "a limited and reduced guarantee not exceeding 7,000 miles" will still apply.

DISABLED SERVICE MEN AS DRIVERS.

The Home Secretary announced on December 22 that as many applications are likely to be received from partially disabled sailors and soldiers for licences to drive public motor vehicles, he has decided to reappoint the committee which considered the subject in 1916. The committee have been asked to review the conclusions then arrived at, and to report whether they should be reaffirmed or modified.

The members of the committee are:—Mr. F. L. D. Elliott, Assistant-Commissioner of Police (chairman); Mr. H. E. Blain, representing the London General Omnibus Company; Mr. C. W. Bowerman; Major A. Tudor Craig, C.B.E., secretary, Soldiers' and Sailors' Help Society; Mr. J. W. Orde, secretary, Royal Automobile Club; Mr. R. J. Simpson, Local Government Board; Mr. A. Smith, of the London and Provincial Union of Licensed Vehicle Workers; and Col. H. J. Waring, M.S., President of the Royal College of Surgeons.

There are two alterations in the composition of the committee. Mr. Blain, operating superintendent of the London General Omnibus Company and Underground Railways, takes the place of Sir Albert Stanley, the late managing director of those undertakings, and now President of the Board of Trade, and Colonel Waring is serving instead of Sir Frederick Eve, F.R.C.S.

The secretary of the committee is Mr. H. A. Tripp, and any communications should be addressed to him at the Metropolitan Police Office, New Scotland Yard, London, S.W.1.

In their report, issued in the second half of the year 1916, the committee dealt thoroughly with the main categories of physical disability from which men presenting themselves for licences might be expected to suffer. The report assumes in each case that the lost limb has been replaced by a suitable artificial one, but it is pointed out that even the most perfectly adapted artificial limb is liable to fracture, and this, if happening at a moment of emergency, might produce serious results. The committee recommended that men suffering from the loss of an eye, a hand, an arm, a foot, or a leg should not receive licences. Apart from the risks attaching to such disabilities, the committee were influenced by the considerations that although every licensed driver has to pass a strict medical examination, the number of deaths caused by vehicles in London has continued to rise, and they held that the logical outcome of lowering the physical standard for drivers would be an increase of street casualties. The committee remark that the great majority of omnibus and tramcar drivers who enlisted became drivers of mechanical transport vehicles, and it is assumed that the loss among drivers of this class will not be abnormally heavy.

UNDERGROUND OPERATING EFFICIENCY MEETINGS.

The third meeting of the fourth year of Operating Department Efficiency Meetings was held on December 10, at the L.G.O.C. Training School, Milman's Street, Chelsea, Mr. H. E. Blain, Operating Manager, presiding over an attendance of over 350 members of the administrative and control staffs of the allied companies.

Papers on "Problems of My Official Life" were read by Mr. W. H. Parsons, chief clerk, Season Ticket Office, District Railway; Miss B. S. Thomas, chief woman supervisor, Underground Railways and L.G.O.C.; Mr. W. Patient, station inspector, Victoria, District Railway; Mr. J. E. Wilkinson, travelling ticket inspector, London Electric Railway; Mr. A. J. Littlewood, beat inspector, L.G.O.C.; Mr. M. J. Embray, operating foreman, Leyton Garage, L.G.O.C.; and Mr. D. G. Squirrel, 'bus mess-room steward, Hendon Garage.

The evening proved one of the most interesting of the whole series, owing to the varied character of the papers. The underlying note of personal interest in the work of transportation and the supreme desire to solve, in the most satisfactory manner, the daily problems it presented, was an evidence of the spirit in which the efficiency of the whole organisation has been built up.

A brisk discussion was opened by Mr. G. C. Ravening, chief divisional inspector, Central London Railway, and Mr. A. Robbshaw, chief 'bus operating foreman, Willesden Garage, and continued by Messrs. Bird, Newman, Savidge, and Cromack, considerations of time alone preventing many others from taking part.

A vote of thanks was accorded to the readers of the papers on the motion of Mr. C. J. Spencer, the newly appointed manager of the Allied Tramways Companies, seconded by Mr. Murray Griffiths, Director of the District Railway.

The next paper of the series will be "A Day in a Controller's Office"—(*a*) District Railway, (*b*) Tubes, and (*c*) L.G.O.C.

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MOTOR TRAFFIC

MOTOR TRAFFIC NOTES.

LEYLAND MOTORS LIMITED, in December, received the sanction of the Treasury to the issue of bonus shares at the rate of 50 per cent. full paid and free of tax.

NO RESTRICTIONS ON TRAFFIC IN FRANCE.—The French Government ordered the removal of the restrictions on the use of paraffin and petrol as from January 1.

USE OF PLEASURE OMNIBUSES.—The Horsing Order No. 2, 1916, prohibiting the use of omnibuses and chars-a-banc for pleasure purposes, was withdrawn on December 16.

THE ECONOMY OF MOTOR SWEEPERS.—It is reported that the two Laffley motor sweepers purchased by Lambeth Borough Council in 1915 have effected a very considerable economy as compared with sweeping the streets by horse-drawn brooms.

GAS TRACTION PRIZE.—The closing date for receiving entries for the Automobile Association £1,000 competition for the best method of using coal gas for propelling motor cars has been postponed at the special desire of the Gas Traction Committee, until January 31.

ARMY LORRIES FOR CHRISTMAS MAILS.—Notwithstanding that there was a considerable falling off in the Christmas postal business in London, the authorities were glad to have the loan of 170 three-ton lorries from the War Office. The services of the drivers were lent with the vehicles.

MOTOR TRANSPORT IN THE JUNGLE.—In his report on the campaign in German East Africa, General van Deventer states that motor transport could only be intermittent owing to the jungle, especially during the wet season. Long stretches of track, he adds, were more suitable for boats than for motor transport.

THE INSTITUTION OF AUTOMOBILE ENGINEERS.—The fourth meeting of the session of the Institution of Automobile Engineers was held on Wednesday, January 8, at the Royal Society of Arts, John Street, Adelphi, when Mr. L. H. Pomeroy read a paper on "Influence of Valve Lift and Combusion Chamber Design on Consumption."

ELECTRIC TRUCKS FOR RAILWAY COMPANIES.—The cartage department of the Great Northern, Great Central, and Great Eastern Railways have placed an order for five 30-cwt. battery trucks with Messrs. Richard Garrett and Sons, Limited, of Leiston, Suffolk. The Lancashire and Yorkshire Railway have ordered two 2½-ton vehicles from the same firm.

ROAD DAMAGE BY GOVERNMENT TRAFFIC.—Through the Joint Roads Committee appointed by the War Office, the Treasury have notified that the Government will be prepared to pay compensation for road damage caused by extraordinary traffic in connection with the haulage of home grown timber, provided the timber has been required for Government purposes.

BRITISH MAGNETOS.—As a proof of the great stride British manufacturers are making in the production of magnetos, we note with satisfaction that Messrs. C. A. Vandervell and Company's output for October alone was no less than 3,500. The C.A.V. magneto figured largely on the motor cycles of our despatch riders on all fronts during the war, and met with their highest commendation.

MOTORS IN THE OCCUPIED GERMAN AREA.—Great numbers of armoured cars and machine gun cars have accompanied the forces representative of the French, British, and American armies in the areas that each is occupying in Germany. The mechanical transport corps is also well represented. British road construction battalions under Brigadier-General Maybury had a great deal of work to do in repairing roads destroyed by the Germans.

JOINT INDUSTRIAL COUNCIL FOR THE TRANSPORT INDUSTRY.—The Motor Transport Employers' Federation is interesting itself in the establishment of a Joint Industrial Council of the Transport Industry. Any owner of a goods carrying commercial motor vehicle is eligible. A copy of the prospectus can be obtained from Mr. F. J. Bristow, general manager of the association, 83, Pall Mall, London, S.W.1. Major-General S. S. Long, C.B., of Lever Brothers, Limited, is chairman of the committee.

PASSENGER TRANSPORT AT WORTHING.—Concurrently with the removal of the restrictions on the use of motor vehicles, the Southdown Motor Services, Limited, have arranged to provide additional facilities. The company have acquired an omnibus undertaking hitherto operated in the town, and besides giving an improved local service they will increase their services in West Sussex. For a decade these services have provided facilities which were beyond the power of the railway company to give.

BENZOL PRODUCTION.—In view of figures appearing in a report of the Manchester Gas Committee it would be interesting to make a computation of the quantity of benzol produced for war service by the gasworks of the country. Between January, 1916, and November, 1918, the various works controlled by the Manchester authority produced 1,786,219 gallons of crude benzol, from which 803,799 gallons of benzol were obtained, together with 267,933 gallons of toluol and 87,311 gallons of solvent naphtha.

MUD SPLASHING BY HEAVY VEHICLES.—Owing to complaints of heavy vehicles splashing mud on the clothes of pedestrians, the Watch Committee of Bradford recently circularised the owners of vehicles on the matter. Efforts were made earlier to deal with the matter by obtaining a new by-law, but at the time that course was found to be impossible. The Watch Committee propose to go into the subject again, and their chairman has expressed the hope that now the war is over labour will be forthcoming to keep the streets cleaner.

MOTOR VEHICLES FOR MUNICIPALITIES.

CHESTER-LE-STREET COUNCIL have obtained an additional motor wagon.

GLASGOW CORPORATION have purchased a Sunbeam car for £500 for use as an ambulance.

WEST RIDING SPECIAL CONSTABULARY are collecting £1,000 for the purchase of a motor ambulance.

KENSINGTON COUNCIL have obtained a De Dion car for the use of the superintendent of outdoor work.

BOOTLE COUNCIL have decided to form a motor department to undertake their motor transport and cartage work in every department with the exception of the fire brigade.

LUTON COUNCIL have asked their engineer to report as to the advisability of collecting house refuse by motor van, and two members were appointed to accompany him to inspect suitable vehicles.

SOUTHEND COUNCIL have received a report as to the use of a movable floor for a motor wagon in order to expedite loading and unloading. A deputation was appointed to inspect vehicles so equipped and to report thereon.

WALLASEY TRAMWAYS COMMITTEE propose to purchase a number of new tramway cars and ten motor omnibuses. The idea is to afford additional facilities and to relieve the tramways by using omnibuses for passengers travelling to points beyond the tramway termini.

NEW OMNIBUSES FOR EASTBOURNE.—Regarding the motor omnibuses ordered by Eastbourne Corporation, Messrs. Leyland Motors, Limited, promise delivery as early as possible, but point out that difficulties exist at present in getting the necessary material for the lighter type of omnibus chassis.

LOCAL AUTHORITIES will be interested to learn that the Austin Motor Company, of Northfield, Birmingham, have a number of 2 to 3-ton lorries now released for civil use. The company announce that Messrs. R. M. Wright and Company, of Lincoln, have taken up the sole representation for Lincolnshire.

LAMBETH BOROUGH COUNCIL have appointed a committee to consider the advisability of substituting motor vehicles for horses, and to report as to what motor equipment would be required. This course was taken on the motion of Councillor J. Mitchell, who is the controller of the London Underground and General Omnibus Group.

BOLTON CORPORATION, having considered the question of provision of a motor for the use of the police department, whenever required, the Fire Brigade Committee have asked the General Purposes Committee to consider the provision of motor vehicles, and the establishment of a municipal garage for the purpose of providing a motor service for the use of the various departments of the Corporation.

COUNTY BOROUGH OF WALLASEY.

ELECTRIC TRAMCARS AND MOTOR OMNIBUSES.

The Tramways Committee is prepared to receive tenders for the supply of ten to twenty Double-Deck Top Covered Tramcars with single trucks and electric equipment complete.

Further particulars as to specification and general conditions may be obtained on application to the Tramways General Manager, Sea View Road, Wallasey.

The Committee does not bind itself to accept the lowest or any tender.

Separate tenders for Tramcars and Motor Omnibuses should be submitted and endorsed outside "Tender for Electric Tramcars" or "Tender for Motor Omnibuses," as the case may be, and reach the undersigned not later than Monday, January 27, 1919.

By Order,

Town Hall, H. W. COOK,
Wallasey, Town Clerk.
January 6, 1919.

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THE
Tramway AND Railway World

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SATURDAY, JANUARY 18, 1919.

THE DEMAND FOR SHORTER HOURS.

IN the interest of both sides, to say nothing of the ratepayers or passengers who may have to foot the bill for concessions, it is much to be desired that publicity should be given to the negotiations between the National Transport Workers' Federation and public passenger undertakings. If this be done, it will be easier to deal with any difficulty that may arise from the employees' dissatisfaction with the result of the meetings, and men inclined to resort to extreme methods may hesitate if they know that they cannot play upon public ignorance. Besides, it is desirable that it should be shown that employers are not unsympathetic towards the desire for shorter hours and a more convenient arrangement of duties. Experience during the war has shown that overtime payment does not do away with physical exhaustion, a state of things that does not conduce to the efficient performance of work. Then the spread-over system is a problem that has baffled solution. More than one tramways manager has more than once tried to remove dissatisfaction by inviting the men to put forward their own schedule of duty, with the result that they were found to be more averse to that than to the manager's plan. Whether the collective wisdom of managers and employees in conference can make progress towards a more desirable system remains to be seen. To the granting of an eight-hour day comparatively little difficulty would attach as far as mere organisation is concerned, but financial considerations raise almost insuperable obstacles. Large and permanent increases in fares, which have already been raised to meet the abnormal costs of working entailed by the war, may seem feasible to those unfamiliar with the sensitive conditions of tramway traffic, but there is the danger of the sequel of fewer passengers being carried and numerous undertakings proving unprofitable. In productive industries shorter hours have been found possible owing to the increased output, but in passenger transport that factor cannot be important. Cars cannot run faster because hours are shorter, nor can more passengers be carried in a car than its capacity allows. No possible gain in economy can be secured by a reduction of hours that will to any extent balance the increase in the wages bill. That addition will be a dead weight of expenditure that will have to be met by new revenue, and the question is, can such revenue be secured? It is certainly doubtful. Many people will find it desirable to economise in every possible way, and in few ways can pence be easier saved than by walking for short distances instead of travelling by car or omnibus. However desirous tramway owners may be to improve the position of their employees, they cannot compel people to ride in their cars, and the employees would do well to consider whether their demands are not being pressed further than the circumstances at all justify. They have received generous increases in wages within the past two years and many undertakings do not yet know where they stand financially. There must be some pause in the demands for changes, if only to discover whether further concessions are possible. We believe that the men's leaders recognise this, and that they will be disposed to effect a compromise rather than to force the issue on demands that owing to the limitations of the passenger-carrying business cannot be justified.

SHEFFIELD TRAMWAYS DEVELOPMENT.

At a meeting of the Tramways Committee of Sheffield Corporation the general manager submitted the following report :—

The present organisation is the same as it was in 1904, shortly after the General Manager had been appointed. At that time the receipts were barely £5,000 per week; to-day they are £13,000 per week. Passengers carried were 61 millions per annum, compared with 160,000 millions per annum to-day. The receipts per route mile were £7,000, whereas to-day they are £14,000. The employees numbered 1,300, compared with 2,100 to-day. Salaries in the department (in 1904) were 1·89 per cent. of total income; in 1918 they represent 1·17 per cent. of total income.

Whilst all branches of the Service feel this growth of the undertaking, the Traffic Department is probably most affected. This Department is supervised by the Traffic Superintendent and the Assistant Traffic Superintendent. The result of the above has been that, for a considerable time past, a large amount of detail work in connection with traffic has developed upon the General Manager, who feels that such duties are now tying him down too much to that branch of the work to the detriment of the undertaking. There are new tramways to open; new motor bus routes to open and develop; new cars, new depots and new car works to be constructed for the department; and arrangements to be made for the single deck cars to disappear from the system at an early date. Wages, employees and trade union matters require constant attention in order to keep the concern working smoothly. The 48 hours week for transport workers has just been applied for. It is impossible that the general supervision which is necessary can be given if the General Manager has to continue to tie himself to details of traffic work in the way that he has had to do during the past few years. He therefore makes the following recommendations :—

That Mr. H. C. Watson (who has been Chief Assistant for many years past) should be promoted to the position of Assistant Manager to give special attention to and to supervise the work of the Traffic Department, at a salary of £500 per annum.

That Mr. W. L. Olivant, Accountant, should also take over the position of Chief Assistant, supervising the General Office work and staff, at a salary of £400 per annum, inclusive of all bonus allowances.

That Mr. H. Wilson relinquish the position of Assistant Traffic Superintendent and be Chief Traffic and Staff Clerk, at a salary of £250 per annum.

That Mr. A. Handford retain the position of Traffic Superintendent at a salary of £350 per annum, under Mr. Watson, who will give constant supervision to that branch of the work.

The recommendations of the General Manager contained in the foregoing report were adopted.

Sale of Pamphlets on Glasgow Cars.—At a recent meeting of the City Council an objection was taken to the practice of selling pamphlets on the Corporation cars. The proceeds of the sales are devoted to war relief funds, but the point was raised that the opinions expressed on some of the topics dealt with did not represent the views of the majority of the people. An assurance was given that when the balance of the pamphlets was disposed of, the sales would cease.

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SERVICE DIFFICULTIES.

Alderman T. Baker, chairman of the Plymouth Tramways Committee, at a recent Council meeting, said that the Tramways Committee would gladly increase the service, but it was impossible to obtain new cars, a sufficiently skilled staff, or an adequate supply of power. The public must be prepared to put up with an inadequate service until demobilisation was much further advanced and the problem of a supply of coal had become less difficult.

Alderman Sir John Courtis, chairman of the Cardiff Corporation Tramways, at the last meeting of the Council admitted that the tramway service was unsatisfactory from the public point of view, but the conditions under which the department was working were very difficult. After four and a half years of war the condition of the track was deplorable. About 240 men were in the Army and the department was still rationed for coal, a fact which in itself made it impossible to run a satisfactory service. He hoped that by the middle of the year something like normal conditions would be restored.

Mr. W. M. Murphy, Chairman of the Dublin United Tramways Company, referring to complaints of the service, has stated that the conditions are entirely due to the shortage of coal. Though the situation has improved somewhat lately, there had been times when it seemed probable that the cars would have to be stopped altogether, as the Company had not two days' supply of coal in hand. The conditions, however, promised to improve in the near future

At Bradford only 117 cars are now available, as against 248 before the war, while there is increased traffic to cope with. Repair shops are hard pressed to keep the cars on the road, as it is impossible to get new equipment.

NEW AND PROSPECTIVE WORK.

The estimated cost of Maidstone tramway extensions, to which reference has previously been made, is £100,000.

At Manchester the Tramways Committee has commenced the construction of one hundred new tramway cars.

Blackpool Corporation are to construct new tramways in Queen Street and other parts of the town at an estimated cost of £15,500.

In our advertisement columns will be found particulars of an invitation for tenders from Liverpool Corporation for 50 electric tramway cars.

Wallasey Corporation is about to place an order for 10 tramway cars and a number of motor omnibuses. Particulars will be found in our advertisement columns.

Southampton Corporation propose to purchase six motor omnibuses for the tramways department, and for this purpose will apply to the Local Government Board for sanction to borrow £7,000.

The Bridges and Highways Committee of the Derbyshire County Council have recommended an increase in their haulage plant by the purchase of additional motor vehicles, wagons, etc. The estimated cost of these is £10,000.

CONTRACTS AND ORDERS.

The Rail Welding Company, of London, have received an order for the repair of 250 tramway rail joints from the Heywood Electricity and Tramways Committee.

Bradford Tramways Committee have accepted tenders from Hadfields, Ltd., for cast and steel crossings, and for copper bonds from the Britannia Lamp and Accessories Company.

Dick, Kerr & Co., Ltd., have recently secured a contract for the supply of a 3,000 kw. 3,000 r.p.m. turbo-alternator set, together with condensing plant, to Cammell, Laird & Co., Ltd. The turbine will be of the Willans-Zoelly type, to operate on steam at 160 lbs. pressure, superheated to 650 degrees Fahr., and the condensing plant of the surface type, with the Willans rotary system of air extraction, the circulating, ejector and extraction pumps being driven by an auxiliary turbine which will exhaust into a feed-heater. The turbo-alternator, by Messrs. Siemens Bros. & Co., will supply three-phase current at 3,300 volts, 50 cycles, and will be fitted with an overhung exciter.

PERSONAL.

Gen. H. P. Maybury, M.Inst.C. E., formerly chief engineer of the Road Board, will become acting secretary and manager on his return from Egypt, after a brief holiday.

Mr. Charles W. Hill has now been demobilised from the Navy and has resumed his position of director of Messrs. Scholey and Company, Ltd., of 56, Victoria Street, Westminister, London, S.W.

Mr. A. L. C. Fell, General Manager of the London County Council Tramways, has been appointed by the Home Secretary to be an additional member of the committee which is considering the licensing of partially disabled men as drivers of public motor vehicles.

Mr. F. W. Ketley, who recently resigned the managership of Norwich Tramways Company, has been presented with a silver cigarette box by the City Police Force. The gift bears the City Arms and the inscription, "F. W. Ketley, Manager, Norwich Tramways, from the City Police, as a mark of esteem and appreciation 1909-1918."

Mr. J. F. Cameron, engineer and general manager of Northampton Corporation tramways, has been unanimously granted an honorarium of £100 by the Town Council, on the recommendation of the Tramways Committee, in recognition of the valuable services he has rendered under exceptionally onerous conditions during the war.

MISCELLANEOUS NEWS AND NOTES.

Six-Day Week at Belfast.—The Belfast Town Council have granted the tramway employees a working week of six days instead of seven.

Goods Traffic at Leeds.—The Corporation tramways parcel delivery system has been extended. There is now a through service between Leeds, Bradford, Halifax and the heavy woollen district.

Track Renewals at Bradford.—The Tramway Committee consider the relaying and doubling the track from Tyrrell Street to Listerhills Road to be urgently necessary.

Depot Extension at Bradford.—Work on the extension of the tramway depot at Thornbury, which had been held up by the war, is to be resumed at once.

Extensions at Hull.—Councillor W. Hakes, chairman of Hull Tramways Committee, has stated that tramway extensions will be carried out as soon as practicable.

Proposed Extension at Musselburgh.—A proposal has been made that the tramways should be extended to Tranent, an adjacent mining village.

47-Hour Week in Sunderland Tramway Depot.—The Tramways Committee have conceded the 47-hour week to the labourers employed at the Hylton Road depot, but have refused to introduce the two-break system demanded by the skilled artisans.

Messrs. Dick, Kerr and Company have purchased Ashton Park estate, about ninety acres in extent, and propose to develop a portion of it as a recreation park for their employees at Preston. Another portion of it may be laid out as a garden city.

Increased Fares at Reading.—Reading Town Council, as a result of the effect which the wages award has had on the financial position of the tramway undertaking, propose to raise the fares by 100 per cent. in some cases, and 50 per cent. in others.

Third Party Risks at Plymouth.—Plymouth Corporation has rejected the Tramway Committee's recommendation that the Corporation should ensure against third party risks. The Committee were about evenly divided, and there was a sharp difference of opinion in the Council.

Omnibuses or Cars at East Ham?—Whether new cars shall be purchased to replace those now out of service, or whether motor omnibuses shall be substituted, is a question now under the consideration of East Ham Tramways Committee. For the repair of the track in Romford Road tenders are being invited on a percentage basis.

Unions Amalgamate.—The London and Provincial Union of Licensed Vehicle Workers and the Amalgamated Association of Tramway and Vehicle Workers recently held a conference, as a result of which it is expected that the two associations will be amalgamated.

More Railway Trains.—Owing to the decreased demands of the Army, the railway companies are making arrangements to run extra trains on the main routes and some of the suburban lines next month. No prospect is held out, however, of an early reduction of fares.

The Rule of the Road.—This question has recently been discussed by correspondents in the *Times*, some of whom favour a change and others argue for the maintenance of the present rule. The case in favour of a change bringing our practice into conformity with the Continental system seems, however, to be conclusive.

Industrial League.—The Right Hon. G. H. Roberts, M.P., presided at a very successful dinner of the Industrial League on the 10th inst., when a number of managers and foremen were present, as well as employees. Mr. Roberts announced that a sum of £20,000 had been given to the League by Colonel William Dupree, three times Mayor of Portsmouth.

A Conductor's Fall from a Car.—At the Preston County Court recently sanction was given to an application under the Workmen's Compensation Act to liquidate for £250, the liability of Preston Corporation, in respect of an accident to a temporary tramway conductor, who in September, 1917, fell backwards off a car and sustained injury to his right arm and wrist.

Fog Delays Traffic.—A dense fog on Monday occasioned great delay to tramway and omnibus services. The fog was particularly dense in London, but its effects were felt in a number of provincial towns. Tramway car and motor omnibus drivers had to proceed with great caution, and the tramway services and traffic generally were much delayed. Numerous accidents occurred.

Manager for Wigan Tramways.—Wigan Corporation, as will be seen from an advertisement in this issue, is inviting applications for the position of general manager of the tramways. The new manager will succeed Mr. Frank Buckley, who has been appointed tramway manager at Bury, and his commencing salary will be £400, rising to £500 by two annual increments of £25.

Edinbugrh Tramway Arbitration.—The arbitration between the Corporation of Edinburgh and the Edinburgh and District Tramways Company was begun at the North British Station Hotel, Edinburgh, on January 14. The arbiter is Sir Alexander B. W. Kennedy, and there appeared for the Corporation the Hon. Wm. Watson, K.C., and Mr. Graham Robertson, advocate, instructed by Andrew Grierson, S.S.C., Town Clerk, Edinburgh, while the tramway company were represented by Mr. Macmillan, K.C., and Mr. C. H. Brown, advocate, instructed by Messrs. Macandrew, Wright, and Murray, W.S. Dick, Kerr & Co. (Limited), who lodged a minute in the process, were represented by Messrs. Davidson & Syme, W.S. Mr. Norman M. Macpherson, S.S.C., acted as Clerk and Legal Assessor. The arbitration is expected to continue for some days.

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Glasgow Tramcar Driver Fined.—A penalty of £3 was imposed at Glasgow Sheriff's Court on a motorman of a tramway car for allowing his car to collide with a lorry in Springburn Road on November 30. It was alleged that the day was foggy and the rails greasy, and that the accused had only had a few weeks' experience. The horse and lorry were thrown by the impact to some distance and the car itself left the rails.

Awakening to London's Tramway Needs.—The "Daily Chronicle" asks for a settlement of the London traffic question as between tramways and omnibuses, and for the absurdity of the numerous dead-ends to be dealt with. Our contemporary adds: "A good deal is said about the ugliness of tramways, but other cities, municipally better managed than London—Glasgow, Liverpool and Birmingham, for instance—contrive to bear with them, and the object-lessons we have had lately in the inadequacy of our transport must have their effect."

Obstructing a Car.—At Clerkenwell Police Court recently, Arthur Randleson, of Tottenham, was fined 20s., and 20s. costs, for obstructing a tramway car in Upper Street. The motorman said that defendant, who was driving a van, took no notice of the gong and remained on the line for three-quarters of a mile, causing a delay of five minutes. A police constable who was riding on a bicycle said that he repeatedly asked defendant to get off the line, but he refused to do so until the witness got off his bicycle and compelled him to draw off the track.

Government and the Railways.—When receiving a deputation of railwaymen recently, Mr. Lloyd George is reported to have said that there was going to be a revolution in the transport industry. The Government intended to appoint Sir Eric Geddes as Minister of Transport, and the State would deal with the whole of the railways and the electrical industry, both for transport and power purposes. The Prime Minister added that an Act for these purposes would be one of the earliest measures introduced into Parliament, and would be speedily passed into law. It does not appear that Mr. Lloyd George used the word "nationalise" in regard to the measure.

Southampton Tramways Service.—A writer in the *Southampton Times* says that the influx of soldiers and the permanent increase of the population in the town has tried the capacity of the tramways to the utmost, and he heartily congratulates Alderman Dunsford, the Tramways Committee, and the general manager, Mr. W. T. Robson, on the way the service has been conducted under great strain. War conditions have prevented the Committee from adding to the rolling stock, and at the present time the number of cars on the road is inadequate. A suggestion has been made that motor omnibuses should be obtained to supplement the services.

Montreal Tramways.—It is reported that negotiations are well advanced for the purchase of the power plants of the Montreal Tramways by the Montreal Light, Heat, and Power Company. Some months ago it was rumoured that some such deal was contemplated. The extension of the tramways system is expected to commence in the immediate future, and the steel rolling mills are starting to work on the rails this month. The rails are of a heavier character than those now in use on certain sections of the tramways in Montreal, and it is anticipated that the whole of the system will be changed to the heavier type within the next two or three years.

Sunday Services at Dundee.—The magistrates have agreed to allow the Dundee, Broughty Ferry and District Tramways Company to run a continuous service on Sunday, cutting out the present stoppage between 11 a.m. and 1 p.m. The company had intimated that if the request were not granted the directors intended to arrange not to begin the service until 1 o'clock in the afternoon. Mr. G. A. Johnston, convener of the Dundee Tramways Committee, said that the Committee had no objection to the change, and they would themselves be making a similar proposal. Mr. Peter Fisher, general manager of the Corporation tramways, remarked that it would be a great advantage to have a continuous service.

The Strain of War.—At the Hull Corporation Tramway Committee, the tramway electrical engineer reported that owing to the severe stress and strain put on rolling stock and overhead equipment during the four years of the war, and the difficulty in obtaining both suitable labour and material, he had been unable to keep up the pre-war standard of maintenance and it will now be necessary to make a thorough overhaul, particularly of the trucks, electrical equipment and fittings, etc., of the overhead equipment. The engineer is at present engaged in re-adjusting demobilised employees with a view to carrying out this work as quickly as possible.

Blackpool Tramway Purchase.—At the ratepayers' meeting held in Blackpool, the promotion of the Bill to acquire the undertaking of the Blackpool and Fleetwood Tramroad Company was approved. The mayor, Alderman A. L. Parkinson, M.P., said that the capital of the company was £150,000 with £35,000 debentures, and the price at which it had been acquired was £270,000, and in addition £4,000 was to be paid to the directors and £10,000 to the general manager, Mr. John Cameron. Mr. Cameron had held the position since the line was constructed in 1898, and he had been offered a certain sum by another company which wanted the undertaking, and to get the matter settled they had offered the larger sum. The success of the company was the best testimonial to Mr. Cameron's valuable services to his employers. At the beginning of the company's existence, the tramway was an experiment—there were elements of risk connected with it, and it was only right that Mr. Cameron's long and faithful services should be adequately recognised. Mr. Cameron's salary has exceeded £1,000 a year, besides bonuses.

Accrington Tramway Strike.—The strike of tramway employees at Accrington was settled on January 10. The running of the cars was resumed in the afternoon on the understanding that the Blackburn cars would not run on the Accrington lines, and no Accrington cars would run through Blackburn. The men had struck in sympathy with the Blackburn members of the Tramway and Vehicle Workers' Union.

Turning Cars without Another being Close Behind.—Notwithstanding that there has been a great reduction in the number of workpeople employed at Woolwich Arsenal, the pressure upon the tramways is still great. Woolwich Borough Council have communicated with the management on the question of more frequent services between Woolwich, Greenwich Park and Abbey Wood and also between Woolwich and Eltham. It was stated, at a recent meeting of the Council, that the old plan of turning passengers out of the cars at the farm in McLeod Road has been reverted to, although the general manager had stated that no car should be turned unless another was following close up.

London's Motor Omnibuses.—Mr. H. E. Blain operating manager of the London Underground Railways and the General Omnibus Company, has stated that until more of the drivers whose demobilisation has been urgently asked for are released, the company is unable to make use of 200 additional omnibuses that are ready for service. Another 250 omnibuses of the same type as the existing stock are nearly ready, and numbers of these will be available week by week commencing next month. When these 450 vehicles are in service the total number of omnibuses in London will be brought up to 2,400. This number will be about 1,000 less than the number in service before the war. The new type of omnibus which the company is constructing will not be ready until some months later.

Edinburgh Fares.—A proposal to adopt a uniform fare for any single continuous journey, with transfers, has been rejected by the Edinburgh Tramways Committee. Mr. Pilcher, the general manager, in a report on the subject, stated that he fully realised the importance of the proposal in relation to the housing question but he believed that the desired facilities could best be obtained by, adhering to the zone system of fares rather than by changing to the universal fare system, which in America was being modified under the same principle. What the Edinburgh fares would require was simplification by reducing the number of stages and aiming rather at a cheap penny fare radiating from the centre of the city. This would not preclude the provision of facilities to encourage short distance traffic, which he believed the Edinburgh public would require in the near future.

Blackburn Tramway Strike.—Blackburn Tramways Committee on January 10 issued a statement which reviewed the circumstances of the tramway strike which began after Christmas. The strike arose from the refusal of the members of the Amalgamated Society of Tramway and Vehicle Workers to work with non-members of their union. The committee reaffirmed their decision not to impose membership of any union as a condition of employment, and stated that unless the employees had resumed work by noon on the following Monday they would be considered to have left the Corporation's service. Only three strikers returned to work, and the others have expressed their determination to hold out until the Corporation agree to make it a condition of employment that men shall join the Tramway and Vehicle Workers' Union. About half the usual service of cars is being maintained. The National Executive of the Tramway Workers' Union met in Manchester on January 9, and decided to defer extending the strike to other towns.

POSITIONS VACANT.

COUNTY BOROUGH OF WIGAN.

The Corporation of Wigan invite applications for the position of General Manager of the Corporation Tramways. Salary £450 rising to £500 by two annual increments of £25.

Applicants must have had previous experience in the management and control of Tramways and be possessed of first-class commercial qualifications. It will be considered an added qualification if candidates have also had engineering experience.

Complete terms and conditions of the Appointment and Form of Application may be obtained on application to me.

Applications endorsed "Tramways General Manager" must be delivered to me not later than Monday, the 3rd February, 1919.

WILLIAM HENRY TYRER,
Town Clerk.

Town Clerk's Office,
Wigan.
January 16, 1919.

COUNTY BOROUGH OF WARRINGTON,

Electricity Department.

The Electricity and Tramways Committee of the County Borough of Warrington invite applications for the post of Shift Engineer. Experience in H.T. and L.T. systems necessary. Salary £4 13s. 6d. per week, including Government awards. Form of application and list of duties can be obtained from the undersigned. Applications to reach me not later than first post on Tuesday, January 28, 1919.

Howley, Warrington.
F. V. L. MATHIAS.
Borough Electrical and Tramways Engineer.

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FINANCIAL.

Extensions at Luton.—Luton Corporation has received sanction to borrow £2,000 for the extension of electric supply mains.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Jan. 15 amounted to £69,410 an increase of £16,800 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to January 15 (forty-one and a half weeks) the total receipts were £2,748,022, an increase of £457,969 on the corresponding period of 1918.

Traffic Receipts at Sheffield.—Sheffield Corporation tramway traffic returns for the week ended January 5 for the first time since April 29, 1917, show a decrease when compared with the corresponding week of the previous year. For the week in question the receipts amounted to £11,669 9s. 1d., or £644 19s. 7d. less than the return for the corresponding week of last year. Although less than a year ago, the receipts for the week ended January 5 are larger by £118 than the previous week.

Southport Tramways.—The results for the twelve months ended March 31, 1918, show that the traffic revenue, which amounted to £23,875, was a record for the undertaking. The gross profit of £10,263 is also a record. Owing to the payment out of net revenue of expenses incurred in the purchase of the Southport Tramway Company's undertaking and of war allowances amounting to £334, there is, however, a net loss of £103.

Increased Traffic at Liverpool.—At the meeting of the Liverpool Tramways Committee on January 9, Alderman Russell Taylor, referring to the prosperity of the undertaking, said that the increased revenue must not be regarded as profit, as wages had risen greatly and the cost of materials was much higher. Alluding to the great increase in traffic, he expressed the hope that the public would give the Committee credit for doing the best they could in providing facilities under difficulties. The returns for the year showed that the receipts amounted to £961,022, an increase of £142,955 over those of 1917. The passengers aggregated 195,082,669, an increase of 22,240,115, while there was a decrease in the mileage of 419,814.

Dublin United Tramways Company.—The directors recommend the payment of a dividend at the rate of 6 per cent. per annum, less income tax, for the half-year ended December 31, 1918, on the preference stock, and a final dividend at the rate of 6 per cent. per annum, less income tax, for the half-year ended December 31, 1918 (making 5 per cent. for the year) on ordinary stock, together with a bonus of 1s. per £10 unit of ordinary stock, this bonus being free of income tax. The board have set aside £35,000 to meet deferred replacement of cars and renewal of rails, £15,000 to reserve fund, and written £1,850 off investments, leaving £13,262 15s. to be carried forward.

Ayr Corporation Tramways—The report of the general manager, Mr. William Grant, for the year ended May 15, 1918, states that the total receipts amounted to £24,562 and the working expenses to £14,416, leaving a gross profit of £10,146. After payment of interest and sinking fund charges, and making allocation to the depreciation and renewals fund of £2,547, the sum of £2,118 was transferred to the general borough assessment. The revenue was the highest ever received. The traffic receipts were £23,318, an increase of £3,562. The receipts per car mile were 13·37d., as against 11·79d. Passengers increased by 12·81 per cent. The energy consumption was 1·14, or an increase of ·06 units per car mile, which is attributed largely to the indifferent driving by some of the women. The working expenses, including power costs, were 8·26d. per car mile, and the percentage of working expenses to receipts 58 per cent. In view of the continued increases in working expenses, halfpenny fares were abolished and fare stages readjusted in April last.

Traffic Effect of Eight-Hour Day.—Scottish tramway managers are apprehensive that the eight-hour day for shipyard workers and other artisans will seriously effect tramway receipts, as the dinner hour peak will be largely reduced, if not cut out.

Edinburgh Tramway Employees.—In view of the large number of tramway employees who are to come into the service of the Corporation on June 30, when the working of the tramways is taken over by the Corporation, a sub-committee of the Treasurer's Committee of the Council is to consider the whole position of the employees in relation to the superannuation scheme.

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Complete Equipment
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TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

NAMES.	Week ended	Latest Return. 1917	1918	Incr. or Dec.	Aggregate. Wks.	1918	Incr. or Dec.
Aberdare U.D.C. ..	Jan. 7	440	536	+ 96	40	20,447	—
Aberdeen Corporation ..	,, 8	2,182	2,870	+ 688	32	83,784	+ 14,403
Ayr Corporation ..	,, 11	321	424	+ 103	34	21,434	+ 4,492
Birkenhead Corporation	,, 12	1,766	2,213	+ 447	41	90,097	+ 14,400
Blackburn ,, ..	,, 8	1,224	1,086	— 138	41½	73,784	+ 12,253
Bradford Corporation ..	,, 4	7,812	8,710	+ 898	40	370,782	+ 62,165
Burnley Corporation ..	,, 11	1,790	2,493	+ 703	..	..	..
Burton-on-Trent Cor. ..	,, 12	344	435	+ 91	41	16,985	+ 3,965
Bury Corporation ..	,, 12	1,357	2,020	+ 663	41	84,096	+ 16,353
Chatham & District ..	Dec. 31	578	899	+ 321	52	66,819	+ 661
Cork Electric	,, 26	609	600	— 9	52	31,510	+ 2,844
Derby Corporation ..	Jan. 11	1,114	1,434	+ 320	41	61,659	+ 11,667
Dundee City	,, 8	1,595	2,179	+ 584	54	66,385	+ 13,125
East Ham Corporation ..	,, 11	1,194	1,586	+ 392	40½	64,294	+ 8,004
Glasgow Corporation ..	,, 11	24,874	28,912	+ 4,038	32½	923,929	+ 68,854
Glossop (U.E. Sup. Co.) ..	,, 11	170	210	+ 40	2	391	+ 37
Halifax Corporation ..	,, 7	2,092	2,347	+ 255	40½	114,639	+ 14,525
do. Motor Buses ..	,, 7	48	54	+ 6	40½	2,702	+ 703
Huddersfield Corporation	,, 11	2,893	3,675	+ 782	41	148,864	+ 19,190
Ilford U.D. Council ..	Oct. 12	713	1,000	+ 287	28	28,593	+ 6,779
Ipswich Corporation ..	Jan. 11	555	643	+ 88	40	30,968	+ 3,380
Isle of Thanet ..	,, 11	164	304	+ 140	14½	4,641	+ 2,188
Kilmarnock Corporation	,, 11	203	293	+ 90	34½	9,183	+ 2,110
Lanarkshire	Dec. 31	2,009	2,962	+ 953	52	187,352	+ 40,888
Leeds City	Jan. 16	10,209	13,917	+ 3,708	41	554,298	+ 102,862
Leicester Corporation ..	,, 11	3,965	4,832	+ 867	..	..	..
Leyton U.D. Council ..	,, 9	1,639	2,539	+ 900	41	97,183	+ 19,857
Liverpool Corporation ..	,, 11	15,717	20,272	+ 4,555	1½	32,219	+ 6,479
Llandudno & Colwyn Bay	Dec. 27	270	361	+ 91	4	1,149	+ 220
London County Council ..	Jan. 15	52,610	69,410	+ 16,800	41½	2,748,022	+ 457,969
Maidstone Corporation ..	,, 9	242	312	+ 70	40½	11,672	+ 1,597
Manchester Corporation	,, 11	21,663	26,399	+ 4,736	41	1,066,947	+ 210,942
Newcastle-on-Tyne Cor.	,, 11	7,444	8,720	+ 1,276	41	368,550	+ 46,867
Northampton Cor. ..	,, 10	812	960	+ 148	41	35,983	+ 1,412
Nottingham Corporation	,, 9	4,489	5,848	+ 1,359	41	234,577	+ 52,149
Oldham Corporation ..	,, 5	2,802	2,800	— 2	41	141,884	+ 25,756
Reading Corporation ..	,, 9	1,043	1,218	+ 175	40½	52,939	—
Rhondda Tramways ..	Dec. 19	1,544	2,003	+ 459	51	91,842	+ 15,186
Rotherham Corporation	Jan. 8	1,854	1,858	+ 4	40½	94,091	+ 20,399
Sheffield Corporation ..	,, 12	11,945	12,885	+ 940	41½	556,218	+ 50,422
Southampton Cor. ..	,, 8	2,043	2,389	+ 346	40½	103,816	+ 19,410
Southend-on-Sea Cor. ..	,, 8	535	1,095	+ 560	41	54,691	+ 17,851
South Shields Cor. ..	Dec. 21	997	1,108	+ 110	38	43,919	+ 7,719
Sunderland Corporation..	Jan. 11	1,770	2,404	+ 634	41	89,277	+ 13,421
Swindon Corporation .	Oct. 30	253	282	+ 29	30½	9,428	+ 1,005
Torquay Tramways .	Dec. 19	631	775	+ 145	51	45,682	+ 11,859
Tyneside Trys. & Trmrds.	,, 18	711	872	+ 166	25	25,148	+ 3,171
Wallasey Corporation .	Jan. 11	1,368	1,961	+ 593	40½	76,989	+ 12,115
Walsall Corporation ..	,, 11	983	1,257	+ 274	41	50,887	+ 1,049
Walthamstow U.D. Coun.	Jan. 11	1,043	1,379	+ 336	41	59,471	+ 9,330
Warrington Corporation	Dec. 12	678	814	+ 136	37	28,165	+ 7,418
West Ham Corporation	Jan. 9	3,300	4,721	+ 1,421	40½	186,569	+ 37,295
Wigan Corporation ..	,, 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1916-17	1917-18	Aggregate. Wks.	1917-18	Increase or Dec.
Anglo-Argentine	Jan. 7	£53,008	£60,067	1	£60,067	+ £7,059
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Nov. 10	3,405	3,570	32	27,090	+ 1,512
Brazilian Traction (Mrs.)	Oct.	8,006,000	8,052,000	43	85,782,000	+ 9,346,000
Brisbane	Dec.	35,019	38,135	52	440,014	+ 43,675
British Columbia .. $	Nov.	525,629	612,893	21	2,727,030	+ 358,925
Buenos Aires Lacroze ..	Dec.	40,901	50,460	26	259,224	+ 28,748
Burmah Tram. & Light Rs.	Nov.	27,760	34,467	17	141,946	+ 31,350
Calcutta .. .. Rs.	Jan. 11	74,044	88,190	1½	142,947	+ 23,868
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Dec.	4,424	2,950	52	46,864	— 2,702
Cordoba	Aug.	14,233	15,734	21	79,054	+ 8,740
East India	Dec.	1,099	2,048	21	9,953	+ 3,680
Hong Kong.. .. $	Nov. 16	12,308	14,028	46	637,088	+ 14,768
Kalgoorlie	Aug.	2,911	3,340	34	22,123	+ 1,058
La Plata	Dec.	4,606	5,792	52	62,618	+ 13,655
Lima	Oct.	37,612	45,336	44	435,004	+ 75,199
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Dec. 31	46,646	43,146	52	942,232	+ 94,912
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	— 83,959
Manila .. .. $	May	61,500	93,500	21	367,500	+ 100,060
Montevideo	Dec.	34,025	38,441	8	70,139	+ 5,054
Pernambuco	Jan. 5	5,467	5,734	1	5,734	+ 267
Peruvian .. .. $	Dec.	1,101,090	1,057,990	26	6,020,715	+ 67,555
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Dec.	5,438	6,188	52	71,992	+ 11,176
Shanghai .. .. $	May 29	24,611	24,708	21	523,298	+ 20,542
Singapore .. .. $	Nov. 30	12,173	12,983	48	666,740	+ 48,923
Toronto .. .. $	Nov.	1,052,000	1,071,106	48	11,716,181	+ 729,183
Winnipeg .. . $	Nov.	305,881	283,721	48	3,252,863	+ 213,466

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SATURDAY, JANUARY 25, 1919.

THE CONTROL OF TRANSPORT.

THE whole question of transport, including that of road control, is far too near to the national interest to be allowed to become the subject of sectional controversy. Yet this is exactly what will happen if the Government do not view the problem as a whole and disregard the criticism of those whose interest in the matter is confined to particular sections of it. It is understood that the Government's present plan is the formation of a Ministry of Ways and Communications over which Sir Eric Geddes is to preside. From the national point of view this seems to be an advantageous arrangement; but no sooner was the proposal announced, however, than various bodies more especially concerned with road transport raised a protest on the ground that the question of roads is so important that it should be dealt with by a separate Ministry. The lack of co-ordination between the various means of transport in the past has been a great disadvantage, and this must be removed if we are to secure necessary progress in means of communication. No one doubts that there must be an enormous expansion of transport by road, and as there must be new arrangements for road construction and maintenance, it is difficult to see why this work cannot best be done by a department of the new Ministry. Transport exists for the people and not for the advantage of those interested exclusively in any of its particular forms.

The opportunity of reducing what is merely a tangle of conflicting interests to something like an intelligent system must not be lost. The whole question of transport needs to be viewed as a whole and principles of co-ordination between its various sections carefully worked out with a view only to public welfare. The Government must hold the balance between conflicting interests, and see to it that the utmost use is made of each system in the circumstances to which it is best adapted. To have separate Ministries contending with one another for the introduction of different systems and attempting to curtail the use of all but the favoured one, would be a national misfortune. Both rail and road traction must be enormously developed to assist in the industrial progress of the country, and clearly this can best be done under the supervision and co-ordination of a single Ministry working with the object of attaining an efficient and economical system of communication. We have no fear of the repression of road transport for it is too closely bound up with the future prosperity of the country to suffer from neglect. After the immense services of motor transport in the war, the public is wide awake to its great possibilities, and no Minister who was not prepared to assist its progress could long retain office.

SERVICE DIFFICULTIES.

Glasgow Tramways Department is gradually arranging a service which will meet the convenience of workmen under the 47-hour week. The difficulty is the shortage of cars and men. All available cars are required to meet the rushes between 7.30 and 8 a.m., and 5 and 6 p.m. The demobilisation of old drivers and conductors has not yet made appreciable progress, and owing to the shortage of the repair staff a complete service cannot yet be given.

As will be seen from an advertisement in this issue, the Liverpool Corporation are advertising for fifty new tramway cars, in addition to about one hundred motor omnibuses for which tenders were recently invited. It is hoped that these vehicles will enable the department to relieve the public of the inconvenience they have inevitably suffered during the war. The *Liverpool Courier* very justly remarked in a recent issue that it was not the fault of the Tramway Committee that they were unable to provide cars to relieve the congestion. The traffic had grown enormously, and it had hitherto been impossible to obtain new rolling stock.

At a recent meeting of the Dundee Tramways Committee, Mr. Peter Fisher, general manager of the tramways, said that the department was worse off for men just now than during any other period of the war. He had recently visited Dick, Kerr and Company's car works at Preston, and found that they were willing to submit a tender for cars. The Committee had agreed to get twelve new cars. The cost would, however, be double what it used to be.

Mr. Arthur Ellis, general manager of the Cardiff Corporation Tramways, in alluding at a meeting of the Tramways Committee to complaints of the service, said that people appeared to forget that there had been a war on for four and a half years. The rolling stock was in need of maintenance, but they could not improve matters until they had a decent track. Sir John Courtis, the chairman, remarked that they must have reconstruction of the track soon. In the meantime they were doing the best they could to improve matters. It was decided to ask the Public Works Committee to give immediate attention to the repair of the track.

The *Yorkshire Evening Post* says that many complaints about the local tramway service which they receive are written with a heat that, if words burned literally, would consume the paper on which they are written. The editor remarks that loose thinking characterises the greater number of the letters, and he has ceased to print even a selection from them because he does not see how tramway committees can give a thoroughly efficient service under the present conditions of national stress. It adds: "We must be fair. There is a greatly increased traffic, and an equipment sadly deteriorated. Time must be allowed for restoration, and if, after the men come back, and the cars are repaired, and more obtained, there is no improvement, then it will be fitting to call for a reckoning."

Birmingham Tramways Committee are making strong efforts to improve their service. At a meeting of the Committee on January 21 it was arranged that the general manager, Mr. Alfred Baker, should go to London in order to take all possible steps to secure priority certificates for the supply of material required to place the whole of the cars in such condition that they can be used. Mr. Baker recently stated that they are at present carrying 50 per cent. more passengers with 20 per cent. fewer cars than in 1914. It adds to the difficulty that the additional passengers are mainly superimposed on the periods of maximum demand, *i.e.*, between 7.30 and 9.30 in the mornings and 5.30 and 7.30 in the evenings.

TRAMWAYMEN'S DEMANDS.

At a meeting of the managers of all the Scottish tramways held at Edinburgh on January 14, a resolution was unanimously agreed to that the demands of the tramway employees for a 44-hour week must be resisted, as it would have most serious financial results on a great many of the tramways owned whether by municipalities or companies.

In the course of the discussion it was stated that the proposal if adopted would involve Glasgow Corporation in an additional expenditure of £500,000, while in Aberdeen the wages bill would be increased by about £50,000. The managers considered that with the additional wages already granted to the employees they were well paid, and that the conditions of labour were satisfactory. Definite action is to be taken to resist the demands.

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L.C.C. TRAMWAY MATTERS.

The London County Council held its first meeting after the Christmas recess on Tuesday last, when only a few reports dealing with tramway matters were submitted by the Highways Committee.

The comparative traffic statement showed that the number of passengers carried on the tramways during the five weeks ended January 8, 1919, aggregated 63,441,899, an increase of 9,967,294 as compared with the corresponding weeks of 1917–18. The traffic receipts amounted to £351,283, an increase of £89,174.

During the recess tenders were received from selected firms for the supply of cotton-covered copper wire, vulcanised bitumen cable, and rolle steel bars, and for the supply of jumper cable.

It was reported that one person had been fined for obstructing the Council's cars, several had been given the option of paying a fine or undergoing a term of imprisonment for assaulting officials, two persons were fined for travelling beyond the distance for which they had taken their tickets, one for refusing to pay his fare, and no fewer than nineteen persons were fined for spitting on tramway cars.

The General Purposes Committee reported that in view of requests by certain Government departments they had notified officers and employees of the Council who had been granted leave of absence to undertake Government work or work of national importance, that the date after which the Council could not bind itself to reinstate in its service those of its officers and employees not being members of H.M. Forces, who were at present engaged upon such work, had been postponed to March 31, 1919.

CONGESTION OF TRAFFIC.—SHORTAGE OF MEN AND CARS.

On the reception of the report of the Highways Committee, Mr. J. D. GILBERT moved the reference back in order to call attention to the congestion of tramway traffic and the inadequacy of the various services, particularly in South London. He could offer no solution to the problem, but felt that the circumstances of the tramway services demanded alteration and improvement without delay. The state of affairs at Victoria and the Embankment was extremely bad. If the policy of the Council was to take over tramways outside the county area, they would be told to first obtain proper control of their own system.

Rev. Dr. SCOTT LIDGETT said the public expected a careful statement as to the immediate programme of the Committee in regard to this very important matter. The public were extremely irritated and suffering great discomfort.

Mr. G. H. HUME, Chairman of the Highways Committee, in replying, assured the Council that the Committee were fully alive to the situation. They were doing everything that was possible to improve matters. The tramways were now carrying 100 million more passengers than before the war. He referred to the difficulty of obtaining material for car repairs and track maintenance, and this coupled with reduced staff made reduction in services inevitable. He detailed some of the practical steps taken to ease traffic at rush hours by the release from work of employees at intervals. They were trying to get men back from the Forces and there was a tremendous amount of work to be done on renewals. The Committee were faced with great difficulties, but he agreed that they would have to be overcome. It was fortunate that during the war they had been able to get more power machinery erected at the Greenwich generating station, and he hoped that shortly the department would find itself with more elbow room than it had to-day.

The amendment was withdrawn, and the report was adopted.

MISCELLANEOUS NEWS AND NOTES.

Fine for Striking.—For participating in a strike, the Perth, Australia, Tramways Union has been fined £25, and several members of the union £5 each.

Plan for Tramway Subway at Sheffield.—A draft scheme for a tramway subway in the centre of Sheffield has been approved by the Improvements Committee.

The Austin Motor Company propose to take up the manufacture of electric lighting and power plants at their well-equipped works at Longbridge, Birmingham.

Demobilised L.C.C. Tramway Men.—It is reported that 236 more tramway men of the London County Council have now been released from the Army.

Tynemouth Extensions.—The Town Council is promoting a bill providing for the acquisition and extension of the undertaking of the Tynemouth and District Tramways Company.

South Shields Extensions.—The Treasury has been asked to sanction the necessary loan to the South Shields Corporation for the tramway extensions authorised in 1915.

Trolley Wheels at Ayr.—During the last year 182 trolley wheesl were used on the Corporation tramways, the average mileage obtained being 4,043, a very good result, as the manager remarks, on a system with so much side running.

Free Passes Discontinued.—Dundee Tramways Committee has refused a request of the employees at the central depot for free passes to and from their work. The privilege had recently been withdrawn owing to its misuse.

New Cars and Omnibuses for Portsmouth.—It is proposed to purchase 25 new cars and 20 motor omnibuses for the Portsmouth Corporation tramways. The latter will be used as feeders from the outward termini of the tramways. New car shelters will be constructed in the neighbourhod of Eastney.

New Cars Required.—In this issue the Corporations of Liverpool, Wallasey, Warrington, and the County Borough of East Ham are advertising for tenders for tramcars and equipment. Manchester Corporation is advertising for tramcar motors and trucks.

Wallasey Tramway Extensions.—Wallasey Corporation is considering the prospective expenditure of £30,000 for new cars and motor omnibuses and reconstruction of the track. The doubling of various lines is urgently required but Parliamentary powers will have to be obtained.

L.G.O.C. Absorbs the Associated Omnibus Company.—The shareholders have confirmed the resolutions passed at a meeting held on December 31st last approving the sale of this undertaking to the London General Omnibus Company and the voluntary liquidation of the Associated Company.

Liverpool Overhead Railway Co.—A final dividend for the half year ended December 31 last has been declared at the rate of 5 per cent. per annum, less income tax, on the preference shares, and 4 per cent. per annum on the ordinary shares, making the rate for the year 5 per cent. on the preference shares and 3¼ per cent. on the ordinary shares.

Glasgow Parcels Service.—The parcel service which was begun a few weeks ago is at present limited to the carriage of parcels between two receiving stations. It is thought that the service will be made more popular by a distribution of parcels to consignees at the Uddingston end and it is possible that arrangements will be made for this.

Petrol Control.—Sir Evan Jones, Bart., M.P., has resigned the position of Controller of Petrol owing to the withdrawal of restrictions in the use of motor spirit for civilian purposes. During the continuation of licences for motor spirit under the Finance Act, 1916, the work will be carried on at 19, Berkeley Street, London, W.1, under the direction of Mr. P. G. L. Webb, C.B.

Cost of Wood Paving.—The Bristol City engineer has recently submitted to the Works Sub-Committee a report on the work which is urgently needed. In spite of restricted work the estimated expenditure for the current year exceeds the pre-war estimates by £32,000. Wood paving before the war cost about 9s. per square yard, but at the present time the cost is at least 35s. per square yard.

Corporations and their Employees.—The Corporation of London are arranging a special committee to consider questions which have arisen, or may arise, between the Corporation and any of its employees. The committee will have authority to confer with such employees and their representatives. Similar arrangements are being made by Bradford and several other provincial corporations.

Manager for Wigan Tramways.—The salary of the tramways manager about to be appointed by the Wigan Corporation will commence at £450, not £400 as mentioned in our last issue, and rise by two annual increments of £25 to £500. The Corporation are inviting applications for the position, and particulars will be found in our advertisement columns.

Depot Extension at Lincoln.—Lincoln Corporation proposes to ask the Local Government Board for sanction to borrow £5,000 for the extension of the tramway car sheds. Three additional tramway cars are to be purchased. A scheme drawn up by Mr. Stanley J Clegg, manager and engineer, for the alteration to the sheds provides for housing a number of extra cars as well as omnibuses which the Tramways Committee expect to obtain.

Stoppage at Cardiff.—Cardiff trammways were stopped on January 20 for over two hours owing to a burn-out on a cable supplying power to fans controlling the induced draught to the boilers at the power station. To maintain the power supply to local industries and to reduce the load on the boilers remaining in commission, the traction feeders had to be cut off one by one until eventually the entire system was shut down.

Motorman's Uniform.—Judge Graham, in the Bow County Court on January 17, awarded a motorman of the West Ham Corporation tramways 30s. and costs for wear and tear of his personal clothing, to which he contended that he was entitled owing to the fact that he was not supplied with a uniform from the time he entered the employment of the Corporation in February, 1918, until the following August.

New Cars for Dundee.—At a recent meeting of the Dundee Tramways Committee, Mr. Peter Fisher, general manager of the tramways, said that the department was worse off for men just now than during any other period of the war. He had recently visited Messrs. Dick, Kerr and Companys' car works at Preston, and found that they were willing to submit a tender. The Committee agreed to get ten complete cars, and twelve car bodies. The cost would, however, be much higher than it used to be.

Equipment for Brighton Cars.—Mr. William Marsh, engineer and manager of the Brighton Corporation tramways, has advised the Town Council to spend about £6,200 on new car motors. Many of the motors are worn out, and those of ten cars have had to be completely scrapped. The next summer s traffic cannot be dealt with by the reduced number of cars now running. Mr. March states that he had taken the first place in the waiting queue at Messrs. Dick, Kerr and Company's works, for sixteen car sets or thirty-two motors, subject to argeement as to price. Messrs. Dick, Kerr and Company have offered the Corporation forty car motors at £300 per car set. Delivery is expected to begin early in May and to continue at the rate of eight motors per fortnight. The price for a complete car equipment is £450, as compared with £273 10s. in June, 1914, an increase of 64 per cent. Mr. Marsh advises the acceptance of the offer of the twenty car sets at £300 per car, and also the necessary number of gear cases at about £10 per car extra.

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The Institution of Automobile Engineers.—The fifth meeting of the session of the Institution of Automobile Engineers will be held on Wednesday, February 5, at the Royal Society of Arts, John Street, Adelphi, W.C., at 8 o'clock, when Mr. G. D. Leechman will read a paper on "Efficient Invention, with Special Reference to Patents affected by the War." Cards of invitation to the meeting may be obtained on application to the Secretary of Automobile Engineers, 28, Victoria Street, Westminster, S.W.1.

Government Control of Railways.—According to the Parliamentary correspondent of the *Times*, the bill for the establishment of the Ministry of Ways and Communications is ready and will be introduced as soon as Parliament assembles. The bill is described as an "enabling" measure designed to define in general terms the powers of the new department, which will be given power to take over and control railways and canals. Sir Eric Geddes will be the first Minister of Ways and Communications.

The London Labour Party intend to put into the field more than sixty candidates at the County Council elections in March next. They promise an "absolutely new programme." One project is to make the whole district within a radius of at least thirty miles of Charing Cross a town-planning area, and to map out a green belt outside with arterial roads connecting the towns beyond. The problem of transit, which is closely allied to housing, they would seek to solve through public ownership of all means of transport.

Women Conductors at Birmingham.—According to the "Birmingham Gazette," the women conductors at Birmingham have with few exceptions "made good." Many of them express regret that it will soon be necessary to give up their employment owing to the return of the men whose places they have taken. The average earnings of those working on a seven hour shift are about 30s. a week, while those who work longer shifts and overtime sometimes earn as much as £4 a week.

Motors to Link up the Tramways.—Mr. Arthur Ellis, electrical engineer and tramways manager of Cardiff Corporation, has submitted a report as to tramway extensions and means of transport between the city and the adjoining districts, and the matter is to be brought before the Parliamentary Committee. Mr. Ellis in his report points out that the object in view is the development of the outside districts, probably by motor omnibuses, in order to feed the tramway system.

Strike at Dundee.—The employees of the Dundee, Broughty Ferry and District Tramways struck work on Sunday morning last during the forenoon church service. Three weeks ago the company introduced a new arrangement by which the cars were kept running during the morning church service instead of standing at the termini from 11 to 12.15. Several of the men were dissatisfied with the longer shifts which the new system involved. The employees resumed work after the church service.

Extensions at Portsmouth.—Portsmouth Tramways Committee on the advice of the Mayor, Councillor John Timpson, who is also chairman of the Tramways Committee, and the general manager, Mr. W. R. Spaven, have decided to apply for Parliamentary powers for the extension of the tramways from the top of Goldsmith Avenue through Milton and Copner to London Road, and also to lay connecting lines from Park Road to Commercial Road through St. Michael's Road.

Proposed Electrification of Stirling Tramways.—Before the war the Town Council intended to convert the horse tramways to the overhead electric trolley system, and the scheme has now been revived. The pre-war estimate was between £80,000 and £90,000, which included the purchase of the present undertaking. The Council proposes to ask fresh expert advice before taking further steps in view of the greatly increased cost of materials. The Tramway Company have stated that if the Council do not come to an early decision, they will substitute petrol motors for horses.

Need for Cars at Bradford.—Alderman Enoch Priestley, chairman of the Bradford Tramways Committee, said that they were willing to buy new cars if they knew where to get them. The Committee were willing to pay a good price, but when the question of delivery was mentioned, makers talked of six months hence. It was impossible to handle efficiently the greatly increased traffic with the present cars and staff. Contracts for motors had been placed in 1915, but it did not seem probable that they would be delivered in the immediate future.

Broken Rail on the District Railway.—On Monday evening during the period of heaviest traffic a rail between Charing Cross and Temple stations on the District Railway gave way, with the result that westbound trains had for a time to be stopped, and a great number of passengers were seriously inconvenienced. Omnibuses and tramcars were, of course, insufficient to provide alternative routes, and the tube railways, which at the best of times are overcrowded, were inundated with passengers who attempted to reach their destination by circuitous routes.

London Tramway Extensions.—At the recent conference of representatives of the Woolwich, Greenwich, and Deptford Borough Councils with members of the Housing Committee of the London County Council, it was suggested that a new tramway route should be made connecting New Cross Gate with Kidbrook and Eltham Road. The chairman of the Highways Committee promised that the tramway from Lee Green to Eltham would be the first care of his Committee when conditions allowed of the work being done. It was arranged to hold another conference of the three boroughs shortly to consider improved means of transit for the districts concerned.

Leeds Corporation Bill has been reported by the Examiner of Private Bills to have failed to comply with the standing order in respect of the proposal to construct tramways in the parish of Middleton, the opponents contending that the construction of the tramways requires the consent of the local highway authorities which has so far been withheld. The chief purpose of the bill is to enable the Corporation to acquire 400 acres of land at Middleton for the purpose of a housing scheme and it is thought that this portion of the bill is not endangered.

Suppressing an Insanitary Practice.—The London County Council are determined to suppress the practice of spitting on tramway cars. Ununiformed officials are being employed to detect offenders, and it is satisfactory to see that at the Mansion House recently the Lord Mayor fined a man 20s. for spitting in a car. Managers will be doing no more than their duty if they take stringent measures to stamp out this disgusting habit, which will no doubt be continued until it is discovered that a substantial penalty is likely to follow infraction of the by-laws.

Kearney High Speed Railway.—Many years ago a demonstration was given at the Crystal Palace of the Kearney high speed system. Last week there was another demonstration at Lavender Hill, Wandsworth, and it is interesting to learn that there is a probability of its adoption from Beresford Square, Woolwich, to North Woolwich. Only a single line is to be constructed at first. Mr. Kearney estimates the cost of the installation of his system at about one-third the usual tube railway installation. Working costs he places at about 50 per cent. The Kearney system is of the monorail type and electric power is, of course, used. Stations will be placed comparatively near the surface, and the line between will be so constructed that full advantage is taken of gravity in obtaining rapid acceleration at the start, while deceleration is effected by a rise at the approach to the following station.

PERSONAL.

Mr. D. H. Davies, borough electrical engineer and tramways manager of Heywood, has been granted an increase in salary of £50 per annum.

Mr. C. O. Silvers, general manager of Wolverhampton Corporation tramways, has been granted an increase in salary to £600 per annum.

Sergeant-Major W. Duddington, of the South Shields Corporation tramways, has been awarded the D.C.M., and has been twice mentioned in despatches.

Lieut.-Col. Morrison Bell has been appointed to represent the London County Council at the annual conference of the Municipal Tramways Association, in the place of Mr. A. H. Scott.

Mr. H. C. Babb, resident engineer for the past three years at Bo'ness electricity works, has been appointed general manager of the Musselburgh and District Tramways and Lighting Company. Mr. Babb will enter upon his duties on February 1st.

Mr. Harry Haward, Controller of the London County Council, who has been serving, at the request of the Army Council, on the Committee appointed to inquire into the staff of the War Office, is also serving on a committee appointed by the Chancellor of the Exchequer to consider the recommendations contained in the seventh report of the Select Committee on National Expenditure.

Mr. H. H. Gregory has been appointed by the Home Secretary to act as Technical Adviser to the Commissioner of Police on public service motor vehicles. Mr. Gregory is the chief of the technical department of the Royal Automobile Club, a member of the Institute of Mechanical Engineers and the Institute of Automobile Engineers. Upon the imposition of the motor vehicle duties two years ago, he was appointed adviser to the Customs and Excise.

Inspector Smalley, who has been in the service of the City of Oxford Electric Tramways Company for more than three years, was recently appointed traffic superintendent of the Musselburgh electric tramways. On leaving he was entertained by the Oxford Finches Musical Society at their headquarters at St. Aldgates, and was presented with a suit-case subscribed for by the staff of the tramways company. Mr. Campbell, the traffic manager, congratulated Mr. Smalley on his appointment and wished him success in his new position. Councillor Harris spoke in high appreciation of Inspector Smalley's unfailing tact and the ability he had displayed in the difficult times through which they had passed.

Mr. W. Worby Beaumont has resigned the appointment of Technical Adviser to the Chief Commissioner of the Metropolitan Police on public service motor vehicles and tramway cars, but it is understood that his services will continue to be available as a consultant. Mr. Beaumont has for many years been a member of tramway and motor organisations, and he received the Scotland Yard appointment in 1905. At that time the motor omnibus was an unreliable vehicle, but in 1906 it began to be constructed under regulations which effected considerable improvement. A great step in advance was effected as the result of amended regulations issued in 1909. The weight was reduced to 3½ tons and the running became comparitively noiseless, while the use of oil trays prevented the smearing of the roads with lubricants. The only portion of the regulations which has not been enforced is the clause which requires the use of a speed governor. The 1909 regulations will shortly give place to the amended rules issued in April, 1917, to govern new construction after the war. The chief new requirement entails a further reduction of weight.

Mr. A. A. Blackburn, on leaving his position as Chief Engineer of the Belfast City Tramways to take up the management of the Huddersfield Tramways, was presented with an illuminated address

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by the members of the staff at Belfast. The General Manager (Mr. J. S. D. Moffet), who entertained the subscribers at Ye Olde Castle Restaurant, paid a glowing tribute to the good work done by Mr. Blackburn during the 14 years he occupied the position, first as Rolling Stock Superintendent, and latterly as Chief Engineer of the Belfast City Tramways, and assured him of the good wishes both of himself and staff for a successful career in his management of the Huddersfield Tramways. Mr. Moffet was supported by Mr. H. Vernon (Engineering Department), Mr. P. Williamson (Body Shop), Mr. Harrison (Overhead Department), Mr. T. H. Brennan (Stores Department), Mr. J. Blemings (Chief Motor Inspector), Mr. S. Carlisle (Office Staff), Mr. G. Bartley (representing the motormen and conductors), and Messrs. Birch, Hutchinson and Stewart (Works Department). Mr. Blackburn suitably responded, and thanked those who had worked with him during his term of office for their loyal support and co-operation.

FINANCIAL.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Jan. 22 amounted to £69,004 an increase of £15,456 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to January 22 (forty-two and a half weeks) the total receipts were £2,817,027, an increase of £473,427 on the corresponding period of 1918.

Yorkshire (West Riding) Electric Tramways Co., Ltd.—The directors in their report for the year ended December 31, 1918, state that the traffic and other revenue aggregated £140,568. After providing for debenture interest and making provision for deferred repairs, there is a net income of £15,303. Adding the amount brought forward from last year, viz., £20,609, the available balance is £35,912. This sum has been appropriated as follows:—Dividend at 6 per cent., less income tax, on the cumulative preference shares, £9,888; purchase of funded preferential dividend certificates, £11,187; renewals, depreciation and reserve fund, £12,311; balance carried forward, £2,526.

POSITIONS VACANT.

COUNTY BOROUGH OF WIGAN.

The Corporation of Wigan invite applications for the position of General Manager of the Corporation Tramways. Salary £450 rising to £500 by two annual increments of £25.

Applicants must have had previous experience in the management and control of Tramways and be possessed of first-class commercial qualifications. It will be considered an added qualification if candidates have also had engineering experience.

Complete terms and conditions of the Appointment and Form of Application may be obtained on application to me.

Applications endorsed "Tramways General Manager" must be delivered to me not later than Monday, the 3rd February, 1919.

WILLIAM HENRY TYRER,
Town Clerk.

Town Clerk's Office,
Wigan.
January 16, 1919.

Foreman Overhead Linesman.

Applications for the above position are invited from men with first-class experience on Tramway Maintenance work.—Applications, with particulars of experience, and stating wages required, to GENERAL MANAGER, Rhondda Tramways Co., Ltd., Rheola Road, Porth, Glam.

Permanent Way Superintendent.

Wanted for large Tramway Undertaking in the North of England, Permanent Way Superintendent. A thoroughly practical and experienced man is required, to whom a good salary will be paid.

Apply to Box No. 66, Office of this paper, stating age, experience, and salary required.

Applications will be treated in strict confidence, and no enquiries will be made without first communicating with applicant.

DICK, KERR & Co.,
Limited,

ABCHURCH YARD, CANNON STREET LONDON, E.C.,

ENGINEERS & CONTRACTORS.

Complete Equipment

TRAMWAYS & LIGHT RAILWAYS

at home and abroad

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

NAMES.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C.	Jan. 14	430	526	+ 96	41	20,973	—
Aberdeen Corporation	,, 15	2,020	2,552	+ 532	38	86,335	+ 14,935
Ayr Corporation	,, 18	291	431	+ 140	35	21,866	+ 4,632
Birkenhead Corporation	,, 19	1,611	2,139	+ 528	42	92,237	+ 14,728
Blackburn ,,	,, 15	1,244	1,181	— 63	42½	74,965	+ 12,226
Bradford Corporation	,, 18	6,588	9,677	+ 3,089	42	389,505	+ 67,514
Burnley Corporation	,, 18	1,718	2,661	+ 943	..	..	..
Burton-on-Trent Cor.	,, 19	372	425	+ 53	42	17,410	+ 4,018
Bury Corporation	,, 19	1,415	1,970	+ 555	42	86,067	+ 16,909
Chatham & District	,, 9	1,473	1,520	+ 47	1	1,520	+ 1,47
Cork Electric	,, 9	726	679	— 47	1	679	— 1 47
Derby Corporation	,, 16	1,129	1,458	+ 329	42	63,117	+ 11,997
Dundee City	,, 15	1,413	2,011	+ 598	35	68,396	+ 13,729
East Ham Corporation	,, 18	1,215	1,567	+ 352	41¾	65,861	+ 8,356
Glasgow Corporation	,, 18	21,965	29,002	+ 7,037	33¼	952,931	+ 74,696
Glossop (U.E. Sup. Co.)	,, 18	157	210	+ 53	3	601	+ 190
Halifax Corporation	,, 14	1,851	2,777	+ 926	41½	117,415	+ 15,451
do. Motor Buses	,, 14	40	69	+ 29	41½	2,772	+ 732
Huddersfield Corporation	,, 18	2,856	3,739	+ 883	42	152,604	+ 20,074
Ilford U.D. Council	Oct. 12	713	1,000	+ 287	28	28,593	+ 6,779
Ipswich Corporation	Jan. 18	535	671	+ 136	41	31,640	+ 3,506
Isle of Thanet	,, 18	179	318	+ 139	15¾	4,959	+ 2,327
Kilmarnock Corporation	,, 18	198	279	+ 81	35¾	9,462	+ 2,191
Lanarkshire	,, 9	4,986	5,888	+ 902	1	5,888	+ 902
Leeds City	,, 18	10,324	13,744	+ 3,420	42	568,043	+ 106,212
Leicester Corporation	,, 18	4,256	4,889	+ 633	..	..	..
Leyton U.D. Council	,, 16	1,671	2,459	+ 788	42	99,642	+ 20,647
Liverpool Corporation	,, 18	15,637	19,882	+ 4,245	2¾	52,102	+ 10,724
Llandudno & Colwyn Bay	,, 10	196	292	+ 96	6	1,787	+ 419
London County Council	,, 22	53,548	69,004	+ 15,456	42½	2,817,027	+ 473,427
Maidstone Corporation	,, 16	231	276	+ 45	41¾	11,949	+ 1,642
Manchester Corporation	,, 18	21,722	27,089	+ 5,367	42	1,094,036	+ 216,357
Newcastle-on-Tyne Cor.	,, 18	7,472	8,385	+ 913	42	376,935	+ 47,683
Northampton Cor.	,, 17	757	987	+ 230	42	36,970	+ 1,642
Nottingham Corporation	,, 16	4,526	5,978	+ 1,452	42	240,556	+ 53,601
Oldham Corporation	,, 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation	,, 16	1,025	1,310	+ 285	41½	54,249	—
Rhondda Tramways	,, 9	1,391	2,102	+ 711	1	2,686	+ 849
Rotherham Corporation	,, 15	1,794	1,984	+ 190	41¾	96,076	+ 20,299
Sheffield Corporation	,, 19	12,081	12,939	+ 858	42¾	569,157	+ 51,220
Southampton Cor.	,, 15	2,089	2,379	+ 290	41¾	105,696	+ 19,701
Southend-on-Sea Cor.	,, 15	629	1,103	+ 474	42	55,794	+ 18,324
South Shields Cor.	,, 4	1,072	1,154	+ 82	40	46,121	+ 7,881
Sunderland Corporation	,, 18	1,875	2,431	+ 556	42	91,709	+ 13,978
Swindon Corporation	Oct. 30	253	282	+ 29	30¾	9,428	+ 1,005
Torquay Tramways	Jan. 9	620	735	+ 115	1	975	+ 162
Tyneside Trys. & Trmrds.	Dec. 25	793	813	+ 20	26	25,962	+ 3,190
Wallasey Corporation	Jan. 18	1,350	1,933	+ 583	41¾	78,921	+ 12,697
Walsall Corporation	,, 19	1,016	1,284	+ 268	42	52,172	+ 10,318
Walthamstow U.D. Coun.	,, 18	1,110	1,358	+ 248	42	60,829	+ 9,591
Warrington Corporation	Dec. 12	678	814	+ 136	37	28,165	+ 7,418
West Ham Corporation	Jan. 16	3,472	4,693	+ 1,221	41¼	191,262	+ 38,516
Wigan Corporation	,, 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Jan. 14	£54,406	£24,160	2	£84,227	— £23,187
Auckland (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Nov. 10	3,405	3,570	32	27,090	+ 1,512
Brazilian Traction (Mrs.)	Nov.	7,695,000	7,581,000	48	93,363,000	+ 9,232,000
Brisbane	Dec.	35,019	38,135	52	440,014	+ 43,675
British Columbia $	Nov.	525,629	612,293	21	2,727,030	+ 358,925
Buenos Aires Lacroze	Dec.	40,901	50,460	26	259,224	+ 28,748
Burmah Tram. & Light Rs.	Dec.	26,224	34,593	21	176,539	+ 40,719
Calcutta Rs.	Jan. 18	75,379	88,807	2¾	231,754	+ 37,296
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Dec.	4,424	2,950	52	46,864	— 2,702
Cordoba	Aug.	14,233	15,734	21	79,054	+ 8,740
East India	Dec.	1,099	2,048	21	9,953	+ 3,680
Hong Kong $	Nov. 30	12,561	13,130	48	662,934	+ 15,337
Kalgoorlie	Sept.	3,063	2,947	39	25,070	+ 942
La Plata	Dec.	4,606	5,792	52	62,618	+ 13,655
Lima	Oct.	37,612	45,336	44	435,004	+ 75,199
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Dec. 31	46,646	43,146	52	942,232	+ 94,912
Manaos Rs.	Aug.	150,657	132,507	34	1,152,686	— 83,959
Manila $	May	61,500	93,500	21	367,500	+ 100,060
Montevideo	Dec.	34,025	38,441	8	70,139	+ 5,054
Pernambuco	Jan. 12	4,651	5,117	1½	9,204	— 166
Peruvian $	Dec.	1,101,090	1,057,990	26	6,020,715	+ 67,555
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Dec.	5,438	6,188	52	71,992	+ 11,174
Shanghai $	May 29	24,611	24,708	21	523,298	+ 20,542
Singapore $	Dec. 7	13,040	14,398	49	681,102	+ 50,245
Toronto $	Nov.	1,052,000	1,071,106	48	11,716,181	+ 729,183
Winnipeg $	Nov.	305,881	283,721	48	3,252,863	+ 213,466

WANTED.

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THE
Tramway AND Railway World

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SATURDAY, FEBRUARY 1, 1919.

AN UNORGANISED INDUSTRY.

ONE of the great difficulties of tramway committees and managers in considering applications from employees in regard to wages and other conditions of their employment is the lack of co-ordination throughout the tramway industry. Rates of pay, hours, and other conditions of service vary greatly in different places, and it is at present impossible for the employers in any particular undertaking, however anxious they may be to meet their employees fairly, to know what terms can justly be granted. The great majority of the employers recognise their obligations towards their colleagues, and naturally feel that separate action ought not to be taken by them without regard to the general interests of the industry ; but local circumstances sometimes make it desirable that decisions should be reached without delay. Such decisions could be taken with greater safety and assurance if there was proper organisation. Before any final solution of the questions that are now arising can be reached, it will probably be necessary to hold a general inquiry into the position of the industry under present conditions, and to work out some general scheme which will secure some degree of uniformity throughout the country. Under existing conditions, concessions are extorted from one or another undertaking, and that concession is urged as a precedent on all the others. If new concessions are now to be granted, one essential is that they should be final. It will clearly be impossible to carry on the business of the various undertakings if they are to be subjected every few months to fresh demands. Fares cannot continually be altered ; and yet it is only by changes in fares that any considerable increase in working expenses can be met. It is unfortunate that no further progress has been made with the formation of a Joint Council for the tramway industry. As readers are aware, a draft constitution was agreed to by the employers and by the National Federation of Transport Workers, but the London and Provincial Union of Licensed Vehicle Workers have so far declined to ratify the constitution. The officials of the Federation are, we believe, using their best endeavours to obtain the approval of the Union, and it is possible that the opposition may be withdrawn, although the prospects are not encouraging.

PROPOSED LIGHT RAILWAYS.

Essex County Council is considering a scheme for the construction of several light railways in the agricultural districts which will act as feeders to the main line of the Great Eastern Railway. This is a revival of projects such as were contemplated when the Light Railway Bill was passed in 1906, the principal object of which was to arrange for the despatch cheaply and expeditiously of agricultural produce to London. For various well-known reasons, not the least of which was the opposition of the railway companies to lines not constructed by themselves, the Light Railway Act was by no means so successful as was hoped it would be at the time when it was proposed by Lord Bryce's Committee. There seems, however, to be no reason why light railways, which before the war were so successful in the development of agriculture in Belgium, should not afford great advantages to the British farmer.

Schemes are under advisement in South Lincolnshire for the construction of light railways. The principal lines would serve the marshes and run from Spalding to Sutton Bridge, with a branch from Fosdyke to Boston. Another scheme which, like the former, is a revival of earlier plans, is designed to serve the Crowland and Whaplode Drove districts, that have now no railway communication. Another suggested line would serve the districts north of Boston.

Strong support is being given to the projects for the construction of a light railway between Forest and Elgin and Dallas. The two former are distant eight and twelve miles respectively from Dallas, and there is no regular means of public conveyance, which are urgently required. At a meeting in the Parish of Dallas recently, it was unanimously agreed that some improved method of transport was essential, and it was resolved to secure the construction of a light railway.

Hythe Town Council has decided to support the scheme for the construction of a light railway connecting Hythe and New Romney. It would be laid across the marsh and would serve Lympne by means of a branch line, and also Dymchurch.

Staffordshire County Council propose to assist in the promotion of a light railway from Market Drayton to Shrewsbury by advancing £7,500 as a loan.

BLACKPOOL TRAMWAY EXTENSION.

PURCHASE AND NEW CONSTRUCTION.

A difficulty has arisen between the Blackpool Corporation and the Fleetwood Council with reference to the purchase of the Blackpool and Fleetwood tramroad. As a considerable part of the undertaking is in the Fleetwood district, the Council consider that they should join in the purchase and become part owners of the tramways. The Blackpool Corporation, however, have refused to agree to the proposal. Fleetwood Council intends, therefore, to oppose the Bill which the Blackpool Corporation are promoting in Parliament to obtain powers to purchase the undertaking.

The purchase price has been fixed by agreement at £235,000, and in addition, the corporation will pay the company £13,758, representing the purchase price of £14,000 six months' Treasury bills invested by the company out of the profits earned in 1917, but since realised to meet current liabilities. A further £4,000 will be paid by way of compensation to the directors and the general manager and secretary for loss of office, and the corporation will assume responsibility in connection with the outstanding £35 000 5 per cent. mortgage debentures, redeemable in 1928. Excluded from the purchase are the invested funds of the company, amounting to £42,052, and sufficient cash to pay the declared dividend for the half year ended December 31, 1917, on the share capital.

Blackpool Corporation propose to construct new tramways at a cost of £7,400, a further £1,100 being required for providing electrical equipments and £7,000 for carrying out various street improvements.

Tramways Stoppage at Belfast.—The shipyard and other workers at Belfast struck on Saturday for the establishment of a 44-hour working week. Notices expired at noon, and a few hours after the whole of the tramway service was suspended and the streets were put in darkness owing to the stoppage at the electricity station and the shortage in the supply of gas. On being informed that the electric current was to be cut off, the general manager of the tramways (Mr. J. D. S. Moffet) gave orders to have the cars taken to the depots and in less than half an hour every car disappeared from the centre of the city. Neither the motormen nor the conductors were directly concerned in the dispute, and they would have worked the cars had electrical energy been available. While they are applying through their union for a reduction of hours in connection with the tramwaymen throughout the country, they are making their demands in a proper manner. The strike continued throughout the past week and at present there seems to be little improvement in the situation.

New Shelter at Liverpool.—Liverpool Tramways Committee has consented to erect a shelter for waiting passengers at the Old Swan terminus. The shelter is to be of attractive design and will form an early item in the local reconstruction scheme.

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TRAMWAY EMPLOYEES' DEMANDS.

NEGOTIATIONS BETWEEN EMPLOYERS AND THE MEN.

A meeting of the Municipal Tramways Conference, called to consider what action should be taken with reference to the latest demands of the employees, was held at the Surveyors' Institute, Great George Street, London, S.W., on Wednesday afternoon, following a meeting of the Executive, which took place earlier in the day. After an animated discussion, the Conference authorised the Executive Committee to enter into negotiations with the representatives of the National Federation of Transport Workers with regard to the demands of the men for a 44-hour week and other conditions, and to report the result to the Conference. The men's demands are set out in a letter from Mr. R. Williams, Secretary of the Federation. They were given in our issue of January 16, 1919, and for convenience they are here repeated:—

(1) That the working week shall consist of 44 hours, inclusive of signing on and signing off.

(2) That every employee shall be guaranteed a working week of 44 hours or payment equivalent thereto.

(3) No day's work shall be in excess of eight hours.

(4) In no circumstances shall a reduction in the working day entail a reduction in existing wages.

(5) No spread-over duty shall exceed nine hours, inclusive of meal times or relief.

(6) All national holidays, Sunday, and overtime labour to be paid for at the rate of time and a half.

(7) All employees shall be granted 14 days' holiday annually with pay.

The Executive Committee of the Conference conferred with the Committee of the Tramways and Light Railways Association on Thursday, and yesterday the representatives of both the Conference and the Association met those of the employees.

The Journal of the Tramway and Light Railways Association for January reports the receipt of a letter from the Secretary of the National Transport Workers' Federation, dated December 21, 1918, making application on behalf of the affiliated unions catering for tramway and omnibus employees for various concessions, particulars of which are repeated. A Conference of the representatives of privately owned tramways which are members of the Association was held at Caxton Hall, Westminster, on January 3, when the demands of the employees were fully discussed. The following resolution was passed:—"That a Committee be appointed to meet representatives of the Municipal Tramways Association and of the National Transport Workers' Federation and its affiliated unions to discuss the demands contained in Mr. R. Williams' letter of December 21st, and to report to this conference of employers the result of their deliberations."

The following were appointed members of the Committee:—Messrs. A. H. Beatty (Balfour, Beatty and Co., Ltd.), E. H. Edwardes (South Lancashire Tramways Co.), D. James (Swansea Tramways Co.), C. J. Spencer (London and Suburban Tramway Co.), and W. G. Verdon Smith (Bristol Tramways Co.).

EDINBURGH FARES AND CARS.

Mr. R. S. Pilcher, general manager of the Edinburgh Corporation tramways, submitted to the Tramways Committee on Wednesday a report on the fares to be arranged when the Corporation take over the tramway undertaking on July 1, 1919. The present system could be simplified by reducing the number of stages and aiming at cheap penny fares radiating from the centre of the city. Before the stages can be lengthened, however, the Corporation will require to see some prospect of a reduction in the cost of working. A start should be made with the existing 1d., 2d., 3d. and 1½d. transfer fares. Halfpenny fares, which were discontinued in Edinburgh some time ago, should not be granted. Children under four years of age should travel free, and those over four and under twelve should pay half fares. The season tickets, except on the Portobello route, where there is a special reason for their use, are rejected. Workmen should be carried at half fares with a minimum charge of 1d. No charge should be made for personal luggage under 28 lbs.; above that weight a penny be charged. Tradesmen's parcels should be charged for when over 14 lbs. in weight. The report has been remitted to a sub-committee for consideration.

A sub-committee is considering the whole question of the provision of new cars. It has been suggested that about fifty cars should be got ready when the Corporation take over the tramway system in July next. The idea is that the cars should be so constructed as to be convertible, so that they can be utilised when the system is electrified.

Telephone Wires and Tramways.—Two or three months will elapse before the post office department have made good the damage to telephone wires inflicted by the storm of January 4. It has been announced that but for the war most of the wires effected would have been placed underground. The speedy accomplishment of this task will be welcomed by the public and by the tramway department.

Electrical Contracting Industrial Council.—The *Times* states that the Joint Industrial Council of the electrical contracting industry, at the first meeting, held at Leeds last week, agreed to the establishment of a 47-hour working week, payment to be made as for a 53-hour week, the first full working week under the new arrangement to begin on January 28.

COVENTRY TRAMWAY EXTENSIONS.

The City Council have adopted important recommendations of the Tramways Committee, which are based on a long and interesting report prepared by the general manager, Mr. T. R. Whitehead. Application is to be made to the Board of Trade for consent to important extensions and to borrow £333,616. This amount is the estimated cost of the work at pre-war rates, plus 75 per cent. The plans include the reconstruction and part doubling of certain lines, the reconstruction and extension of several other lines, twenty new cars, new car sheds, alterations to certain buildings, and the provision of a motor wagon.

Mr. W. H. Wale, Chairman of the Tramways Committee, in submitting the report, said that the Committee had in view not only the present needs but prospective requirements, and before coming to a decision they had looked closely into the question of what was the most suitable form of traction to employ in Coventry, and having regard to the peculiar traffic requirements, he was strongly of opinion that a motor omnibus service could not carry the traffic. He dwelt on the greater carrying capacity of tramway cars as compared with motor omnibuses. If the latter were used, 40 per cent. more vehicles would be required. At one point in the city at a particular hour seventy cars passed, and it was estimated that to deal with the same traffic, ninety-two motor omnibuses would be required. Examining the cost of tramways versus motor omnibuses, the Chairman said the comparison was unfavourable to the petrol-driven vehicle, and in coming to a de ision with regard to a motor omnibus service on present routes, the Committee were of opinion that the tramway car was the best system of transport, although motor omnibuses would be a valuable adjunct. Later, they would probably submit a scheme for the use of motor omnibuses as feeders.

MISCELLANEOUS NEWS AND NOTES.

Stirling Tramways Electrification.—The Town Council has decided to obtain expert advice with regard to the present position of the tramway undertaking with a view to its purchase and subsequent electrification.

Stopping Stations at Liverpool.—Certain stopping stations on Liverpool Corporation Tramways, which were abolished some time ago, are now being reinstated, owing apparently to public discontent with the changes.

Price of Rails.—The reduction in shipping rates should have an early effect on the cost of rails, the maximum price of which was recently officially fixed at £17 10s. per ton. In view of probable American competition it is not to be expected that such a price can long be maintained.

Edge Hill Light Railway.—The Board of Trade have recently confirmed the Edge Hill Light Railway Order, 1919, made by the Railway Commissioners authorising the construction of Light Railways in the County of Warwick in the Edge Hill District, and for other purposes.

Woman Killed in Rush for Cars.—At an inquest in Liverpool on the death of a woman, who was described as a sufferer from heart disease and bad eyesight, the coroner found that she had died from injury to the brain caused by a fracture of the skull due to an accident. She was attempting to board a Liverpool tramway car and was knocked down by the crush.

Huddersfield Tramway Extension.—Huddersfield Corporation is promoting a Bill in Parliament for the construction of a tramway to bring their system to the centre of Brighouse. Brighouse Corporation has pressed for the construction of the line and Huddersfield Tramways Committee has agreed to carry out the scheme as soon as practicable.

Car Derailed by Broken Tire.—A London County Council car was derailed at Malpas Road, Brockley, recently, from an unusual cause. While slowly rounding a curve from Lewisham High Road a tire of the off-side front wheel broke and the car left the rails, mounting the pavement and crashing into a wall, which was demolished. None of the passengers was injured.

Omnibus on Fire.—A motor omnibus, which was carrying a full load of passengers, caught fire on London Bridge and caused some excitement. The driver, when he noticed smoke issuing from the bonnet, pulled to the side of the road and the passengers alighted. The driver then played on the engine with the extinguisher and little delay was caused to street traffic.

Triplex Safety Glass Wind Screens.—The new Enfield-Allday light cars are all fitted with Triplex safety glass wind screens before leaving the works. This protection for the safety of the driver and passengers, although adding slightly to the works cost, increases the value of the car, and it is interesting to note that the insurance companies have indicated their appreciation of this fact by lowering their premiums on road risks.

Edinburgh Cable Tramway Stoppages.—Stoppages of the Edinburgh cable cars have caused considerable public inconvenience recently. Two stoppages occurred on January 23. Both affected Princes Street, upon which the various tramway routes converge, and the traffic dislocation was therefore general. The first breakdown occurred about 9 a.m. and the second about 5 p.m., both being at times of peak loads. Mr. J. D. R. Cox, the general manager of the company, regards the position as serious. The recent wet weather has imposed a severer strain upon some of the cables than they are able to bear, and it is impossible at present to obtain new cables.

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Resumption of Services.—The Tramways Committee at Huddersfield have restored some sections of the pre-war services which were discontinued owing to the shortage of coal, but the resumption of the Sunday service is not yet feasible. At Nottingham the cars are now run half an hour later at night, the last car on all routes leaving the Market Place at 10.30. Owing to the shortage of staff the Tramways Committee have not yet been able to provide Sunday service.

Matlock Cable Tramway.—The earnings of the Matlock Urban District Council's cable tramway have again broken the record. The line, which extends up Hilly Bank Road, is only a mile and a quarter long, but includes gradients of 1 in 5½, probably the steepest gradient on any street tramway in the world. The cables are driven at a speed of 5½ miles per hour. The tramway was presented to the Council some years ago by the late Sir George Newnes.

Electrical Tramway in the Balearic Isles.—Manufacturers of electrical tramway plant and electric motors suitable for adaptation to sailing ships are invited to send catalogues and prices to the Camara Oficial de Comercio, Industria y Navegacion, Palma, Balearic Isles. The acting British Consul at Palma states that several important orders have been recently placed by this company.

London Safety First Council has issued an effective poster in three colours, designed to illustrate and suggest a remedy for accidents resulting from pedestrians either walking into the carriage way without first looking around for approaching vehicles or having stepped off the kerb with their backs to on-coming traffic. The advice tendered in the poster to "look around before crossing" is rendered necessary partly by the existing difference between the rule of the road and that of the footpath.

Political Advertisements on Brighton Cars.—The Sub-Committee of the Brighton Town Council appointed to inquire into the circumstances under which an advertisement of the Labour Party, entitled "Vote for Canter and Lewis" was placed on the Corporation cars at the recent general election, has reported that the advertisement was accepted in the ordinary course of business without the character of the last announcement being suspected beforehand. A long discussion took place at the recent Council meeting when the Council accepted the report, but took no further action in regard to it

Edinburgh Omnibus on Fire.—Back-fire in the carburettor of an omnibus belonging to the Scottish Motor Traction Company, Ltd., which was proceeding along Princes Street on Wednesday, caused an explosion and the omnibus was quickly wrapped in flames. There were no passengers in the omnibus, and the driver, whose overcoat caught fire, jumped clear and only suffered some slight burns. The omnibus ran into and overturned a lamp standard opposite the Waverley Market. Almost all the woodwork in the omnibus was destroyed.

Traffic Difficulties at Bradford.—Mr. R. H. Wilkinson, the general manager of the Corporation tramways, in reply to some complaints in regard to the service, has pointed out that only half of the cars used in normal times are at present fit for service, owing to the impossibility of obtaining supplies and labour. About four years ago the department placed an order for one hundred sets of car motors, but these have not yet been delivered. These motors were required to replace motors which should have been superseded long ago. The cars are now working with inefficient motors, causing frequent delays.

Disobedience of a Driver.—At Bow County Court, on January 16, Judge Graham gave a verdict for West Ham Corporation in an action brought against a motorman who had disobeyed an order to drive a car that in his opinion was defective. The motorman sued for a weeks wages and another in lieu of notice, alleging that he could not sound the gong of the car, as the gong pin was too short. He made two journeys with the car, and then left, alleging that he considered it a duty to the public to refuse to drive the car further. For the defence it was shown that the car was taken to a depot a mile and a half away, where an examination showed that there was nothing wrong with it.

Leeds Tramcar Runs Backward.—On nearing the top of a steep gradient at Chapel Hill, on the Leeds side of Morley, a tramway car on January 25th came to a standstill and then suddenly began to move backwards. Owing to the greasy state of the rails and the failure of the brakes to act, the driver lost control and the car quickly gathered speed. It was, however, brought to a standstill on a level stretch of track in time to avoid a collision with an approaching car. The car was chiefly occupied by mill girls returning from their work, and they are described as showing the presence of mind to keep their seats and none of them, consequently, sustained any injury.

London Traffic Congestion.—Dr. J. Scott Lidgett, leader of the Progressive Party of the London County Council, in the course of a recent interview, said that the Progressives meant to put up a great fight on the whole question of tramways, which would be considered in conjunction with the larger problem of London traffic congestion. Pre-war conditions of fares and transfers should be restored as soon as possible. Wasteful motor omnibus competition should be superseded by co-operation. Dr. Lidgett advocates the creation of a Highways and Traffic Authority for Greater London, which should be municipal in character and be empowered to carry out schemes for providing arterial roads, street widenings and similar improvements. The Traffic Committee of the London Society, which has been investigating the subject of transit in London, is developing what is described as a comprehensive scheme to deal with it. Unity of control and systematic development is considered essential to the proper handling of the problem.

New Cars for Manchester.—Manchester Corporation Tramways department is constructing 100 cars at the Hyde Road depot, which will be put into service, it is hoped, within the next six months, but the success of the effort must depend very largely on the supply of labour and material. Tenders are invited for a number of car bodies, particulars of which are given in our advertisement oclumns.

Blackburn Tramway Strike Settled.—Too late for mention in our last issue, a settlement was reached in the Blackburn tramway strike on Friday evening of last week, and the men and women on strike have been reinstated without prejudice. Mr. J. Crank, a representative of the Ministry of Labour, met the representatives of the men and of the Tramways Committee. A Conference was subsequently arranged between the Tramways Committee and representatives of the Amalgamated Society of Tramway and Vehicle Workers, at which the general secretary, Mr. S. Hirst, attended. A settlement was finally reached which provides for the setting up of a Works Committee on the lines of the Whitley Report to deal with questions affecting semi-skilled and unskilled employees, and is conditional on similar terms being granted to the carters by the Masters' Association.

CONTRACTS AND ORDERS.

New Shelters at Dudley.—The Corporation have accepted the tender of Bayliss, Jones and Bayliss, Ltd., for ironwork, and of Messrs. Round and Son, for woodwork required for the erection of four tramway shelters.

Motor Omnibuses for Liverpool.—The Associated Equipment Co., Ltd., have acquired the contract for the Liverpool Corporation's fleet of single-deck omnibuses. This firm, who are sole builders to the London General Omnibus Co., Ltd., with their expert knowledge of omnibus and commercial lorry construction, should feel assured of brisk business in the future. Many other Corporations are negotiating with them for omnibuses and char-a-bancs.

PERSONAL.

We regret to learn that **Mr. J. M. McElroy,** general manager of the Manchester Corporation tramways, who has for some time been in ill-health, will not be able to resume his duties for several months.

Mr. W. MacGibbon, who has recently been appointed manager of the Mexborough and Swinton Tramways, will retain also the management of the Dewsbury and Ossett Corporation and Soothill Nether Urban District Council Tramways.

Mr. H. E. Hammond was entertained by a number of friends at dinner at the Holborn Restaurant on Thursday of last week on his retirement from the position of Traffic Manager of the Metropolitan Electric Tramways, which he has held for many years. Mr. A. L. C. Fell, General Manager of the London County Council Tramways, presided, and those present included Messrs. James Devonshire, B. C. Godfrey, T. B. Goodyer, L. MacKinnon, A. V. Mason, A. H. Pott, A. L. Barber, W. C. Ullmann, H. P. Stokes, F. Schofield, W. Murray, L. Slattery, J. K. Bruce, H. E. Blain, C. J. Spencer, and others.

The Late Mr. Stephen Sellon.—The Journal of the Tramways and Light Railways Association for January, alluding to the death of Mr. Stephen Sellon, one of the Vice-Presidents of the Association, states that the Association thus loses one of its earliest and most active members. He was one of the founders of the Association in June, 1897, and has ever since taken a prominent part in its work. He was a member of the Council up to October, 1908, when he was elected Vice-President and made an honorary member of the Council, whose meetings he regularly attended. A vote of condolence with the late Mr. Sellon's family was passed at the January meeting of the Council.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Jan. 29 amounted to £66,553 an increase of £12,835 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to January 29 (forty-three and a half weeks) the total receipts were £2,883,594 an increase of £486,276 on the corresponding period of 1918.

DICK, KERR & Co.,
Limited,
ABCHURCH YARD, CANNON STREET
LONDON, E.C.,
ENGINEERS & CONTRACTORS.
Complete Equipment
TRAMWAYS & LIGHT RAILWAYS
at home and abroad.

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POSITIONS VACANT.

COUNTY BOROUGH OF WEST HAM.

Tramways Department.

Permanent Way Superintendent.

The Council invite applications from qualified Civil Engineers for the position of Permanent Way Superintendent under the General Manager of Tramways, at a commencing salary of £250 per annum, advancing by two increments of £25 to £300 per annum, plus war bonus, which at present is at the rate of £65 per annum.

Applicants must have had practical experience in the construction and maintenance of tramway permanent way and the control and management of men engaged therein.

Experience in the construction and maintenance of overhead equipment will be regarded an advantage.

Application must be made on the official form, which may be obtained from Mr. M. L. Slattery, General Manager, Tramway Offices, Greengate Street, Plaistow, E.13, and must be delivered, together with copies of three recent testimonials, at my Office not later than 12 noon on Friday, the 14th day of February, 1919.

GEORGE E. HILLEARY,
Town Clerk.

Town Hall, West Ham,
January 29th, 1919.

COUNTY BOROUGH OF SOUTHPORT.

Tramways Department.

Depot Superintendent.

The Tramways Committee invite application for the above position from fully qualified mechanical and electrical engineers, who have had a thorough experience in connection with tramway work. Salary £250 per annum.

Applications, stating full particulars of experience, together with copies of not more than three testimonials, must be delivered at my office, Town Hall, Southport, not later than noon on February 14, 1919.

(Signed) J. ERNEST JARRATT.
Town Clerk.

Town Hall, Southport,
January 28, 1919.

SINGAPORE, STRAITS SETTLEMENTS.

Power Station Engineer required for Singapore, Straits Settlements, to take charge and be responsible to the Management for the working of the Company's Power Station. Must be capable of maintaining and carrying out all repairs to large Corliss Engines, large Diesel Engines, Steam Turbines, Condensers, Lancashire and Water-Tube Boilers and all Electrical Equipment. Power is generated at 550 volts D.C. and 3,300 volts, three-phase A.C.

Must be capable of erecting new plant as required, carrying out all tests and keeping proper power station records.

First engagement for four years.

Salary $450, rising to $500 per month for fourth year. Free passage out and home.

The Straits Dollar is fixed at 2s. 4d.

Age 30 to 35.

Apply in first instance by letter, including copies of recent testimonials, to—

THE SECRETARY,
Singapore Electric Tramways, Ltd.,
19, St. Swithin's Lane, E.C.4.

Armature Winders.

Wanted, Armature Winders accustomed to D.C. Traction Motors. Standard rate of wages and war bonus paid.

Apply in first place by letter to undersigned.

J. B. HAMILTON,
General Manager.

Leeds City Tramways,
Swinegate, Leeds.
January 28, 1919.

Accountant.

Accountant, qualified. Experience engineering works costing; also omnibus or tramway accounts. Income Tax and E.P.D. Age 25 to 30. Salary £300 to £350.

Apply, United Automobile Services, Ltd., Lowestoft.

Draughtsmen.

Draughtsmen required for rolling stock design; experienced in either railway coaches, tramcars, or 'buses.

State age, experience and salary required to the Brush Electrical Engineering Co., Ltd., Loughborough, Leicestershire.

Traffic Clerk.

Experienced Traffic Clerk required by large Provincial Tramways for Head Office Work.

Applications will be treated in strict confidence and should give full details of qualifications, experience and salary required.—Apply, Box No. 18, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, W.C.2.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C. ..	Jan. 21	452	538	+ 86	41	21,511	—
Aberdeen Corporation ..	„ 22	2,050	2,495	+ 445	34	88,832	+ 13,380
Ayr Corporation ..	„ 25	319	395	+ 76	36	22,262	+ 4,708
Birkenhead Corporation	„ 26	1,934	2,088	+ 154	43	94,325	+ 14,882
Blackburn „ ..	„ 22	1,378	1,538	+ 160	43¾	76,504	+ 12,437
Bradford Corporation ..	„ 25	7,472	9,051	+ 1,579	43	398,256	+ 69,093
Burnley Corporation ..	„ 25	2,060	2,501	+ 441	..	..	..
Burton-on-Trent Cor. ..	„ 26	370	412	+ 42	43	17,823	+ 4,061
Bury Corporation ..	„ 26	1,597	1,928	+ 331	43	87,994	+ 17,238
Chatham & District ..	„ 23	1,176	1,228	+ 52	3	3,930	+ 224
Cork Electric	„ 23	577	563	— 14	3	1,796	— 38
Derby Corporation ..	„ 25	1,245	1,445	+ 200	43	64,562	+ 12,196
Dundee City	„ 22	1,486	2,042	+ 556	36	70,436	+ 14,280
East Ham Corporation ..	„ 25	1,267	1,500	+ 233	42¾	67,261	+ 8,589
Glasgow Corporation ..	„ 25	24,081	27,752	+ 3,671	34½	980,683	+ 79,979
Glossop (U.E. Sup. Co.) ..	„ 25	177	211	+ 34	4	812	+ 124
Halifax Corporation ..	„ 21	2,024	2,774	+ 750	42½	120,191	+ 16,202
do. Motor Buses ..	„ 21	47	72	+ 25	42½	2,845	+ 768
Huddersfield Corporation	„ 25	3,239	3,608	+ 369	43	156,212	+ 20,443
Ilford U.D. Council ..	Oct. 12	713	1,000	+ 287	28	28,593	+ 6,779
Ipswich Corporation ..	Jan. 25	583	654	+ 71	43	32,294	+ 3,587
Isle of Thanet ..	„ 25	197	282	+ 85	16½	5,242	+ 2,412
Kilmarnock Corporation	„ 25	219	281	+ 62	36¾	9,743	+ 2,252
Lanarkshire	„ 23	2,399	3,509	+ 1,110	3	12,984	+ 3,149
Leeds City	„ 25	11,057	13,454	+ 2,397	43	581,497	+ 108,966
Leicester Corporation ..	„ 25	4,227	4,838	+ 611	..	..	..
Leyton U.D. Council ..	„ 23	1,667	2,437	+ 770	43	102,079	+ 21,417
Liverpool Corporation ..	„ 25	16,454	19,221	+ 2,767	3½	71,324	+ 13,491
Llandudno & Colwyn Bay	„ 17	202	304	+ 102	7	2,091	+ 521
London County Council ..	„ 29	53,718	66,553	+ 12,835	43½	2,883,594	+ 426,276
Maidstone Corporation ..	„ 25	248	278	+ 30	42¾	12,227	+ 1,673
Manchester Corporation	„ 25	23,382	26,996	+ 3,614	43	1,121,052	+ 220,282
Newcastle-on-Tyne Cor.	„ 25	8,319	7,969	+ 350	43	384,906	+ 47,657
Northampton Cor. ..	„ 24	879	967	+ 88	42	37,937	+ 1,731
Nottingham Corporation	„ 23	5,061	5,966	+ 905	43	246,523	+ 54,507
Oldham Corporation ..	„ 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation ..	„ 23	1,140	1,327	+ 187	42¾	55,576	—
Rhondda Tramways ..	„ 16	1,411	2,099	+ 688	2	4,786	+ 1,537
Rotherham Corporation	„ 22	1,872	2,036	+ 164	42¾	98,112	+ 20,753
Sheffield Corporation ..	„ 26	13,167	12,766	+ 401	43½	581,923	+ 50,879
Southampton Cor. ..	„ 22	2,239	2,339	+ 100	42¾	108,036	+ 19,801
Southend-on-Sea Cor. ..	„ 22	657	1,109	+ 452	43	56,903	+ 18,776
South Shields Cor. ..	„ 4	1,072	1,154	+ 82	40	46,121	+ 7,881
Sunderland Corporation..	„ 25	2,113	2,332	+ 219	43	94,040	+ 14,196
Swindon Corporation .	„ 22	285	314	+ 29	42¾	13,498	+ 1,880
Torquay Tramways ..	„ 16	611	739	+ 128	2	1,714	+ 290
Tyneside Trys. & Trmrds.	„ 8	719	860	+ 141	2	991	+ 1
Wallasey Corporation .	„ 25	1,445	1,848	+ 403	42¾	80,769	+ 13,099
Walsall Corporation ..	„ 25	1,076	1,265	+ 189	43	53,437	+ 10,506
Walthamstow U.D. Coun.	„ 25	1,189	1,307	+ 118	43	62,136	+ 9,718
Warrington Corporation	Dec. 12	678	814	+ 136	37	28,165	+ 7,418
West Ham Corporation	Jan. 23	3,769	4,561	+ 792	42¾	195,823	+ 39,308
Wigan Corporation .	„ 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Jan. 21	£52,850	£54,003	3	£138,230	— £22,034
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Nov. 10	3,405	3,570	32	27,090	+ 1,512
Brazilian Traction (Mrs.)	Nov.	7,695,000	7,581,000	48	93,363,000	+ 9,232,000
Brisbane	Dec.	35,019	38,135	52	440,014	+ 43,675
British Columbia .. $	Nov.	525,629	612,893	21	2,727,030	+ 358,925
Buenos Aires Lacroze ..	Dec.	40,901	50,460	26	259,224	+ 28,748
Burmah Tram. & Light Rs.	Dec.	26,224	34,593	21	176,539	+ 40,719
Calcutta .. .. Rs.	Jan. 25	71,406	82,787	3½	314,541	+ 48,677
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Dec.	4,424	2,950	52	46,864	— 2,702
Cordoba	Aug.	14,233	15,734	21	79,054	+ 8,740
East India	Dec.	1,099	2,048	21	9,953	+ 3,680
Hong Kong.. .. $	Nov. 30	12,561	13,130	48	662,934	+ 15,337
Kalgoorlie	Sept.	3,063	2,947	39	25,070	+ 942
La Plata	Dec.	4,606	5,792	52	62,618	+ 13,655
Lima	Oct.	37,612	45,336	44	435,004	+ 75,199
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Dec. 31	46,646	43,146	52	942,232	+ 94,912
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	— 83,959
Manila .. .. $	May	61,500	93,500	21	367,500	+ 100,060
Montevideo	Dec.	34,025	38,441	8	70,139	+ 5,054
Pernambuco	Jan. 12	4,951	5,117	1½	9,204	— 166
Peruvian .. .. $	Dec.	1,101,090	1,057,990	26	6,020,715	+ 67,555
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Dec.	5,438	6,188	52	71,992	+ 11,174
Shanghai .. .. $	May 29	24,611	24,708	21	523,298	+ 20,542
Singapore .. .. $	Dec. 7	13,040	14,898	49	681,102	+ 50,245
Toronto .. .. $	Nov.	1,052,000	1,071,106	48	11,716,181	+ 729,188
Winnipeg .. .. $	Nov.	305,881	283,721	48	3,252,863	+ 213,466

WANTED.

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SATURDAY, FEBRUARY 8, 1919.

OMNIBUSES FOR LONDON COUNTY COUNCIL.

SEVERAL considerations arise in connection with the proposal of the Highways Committee of the London County Council to apply to Parliament for powers to own and run motor omnibuses for the purpose of linking up the dead ends of tramway termini and for working new traffic centres likely to arise outside of the county. The creation of these new centres will be the outcome of the expenditure of over two and a half millions sterling rendered necessary for housing, in consequence of the inability of private builders to undertake the work under present conditions. This fact in itself is an important reason why the Legislature is likely to grant the powers applied for, even though existing trade interests may oppose the concession. As the Committee suggest, the institution of omnibus services to the new housing centres is a work for which this vehicle is peculiarly suitable, though there may be instances in which it will be desirable that the tramways should be extended straightaway. In making such extensions, however, the Committee advise that with the present high cost of materials to contend with, and with the delay in production, the wisest policy will be to resort to omnibus services. This recommendation implies a recognition of the likelihood of fuel costs falling considerably by the time that the vehicles can be put upon the road. It also implies that with motor manufacturers now free from the obligation to manufacture only for the Government there will be comparatively little delay in delivery. The makers' facilities are extensive enough to supply not only the hundreds of chassis and bodies that would be required by the London authority, but the numerous orders that have begun to reach them from tramway authorities all over the country for exactly the same reasons that have influenced the former. The magnitude which the County Council's demand for omnibuses is likely to reach not only serves to afford an argument for granting the powers to be applied for, but constitutes a reason why an effort should be made to meet the Council's requirements through an existing omnibus undertaking. That such an alternative would cost the ratepayers nothing is a powerful argument in its favour. The case for making an agreement with private enterprise is strengthened when the undertaking is already covering the territory involved or likely to be involved by the starting of a rival service. It will not conduce to public safety to have two competing services, and it needs but little experience to show that success will rest with the undertaking which gives the best long-distance service. That will not be the case with the County Council's omnibuses, which are admittedly to serve only to link up the developing districts with the outer tramway termini and to give a connection between those on the North and South sides of the river. This latter task will be most difficult in achievement, for the journeys for the most part are too short to be likely to attract patronage. Another conderation is that there are omnibuses already passing those points, though not giving a service intended to be connected. The intention of the Council to apply for powers might be used to the public advantage as a lever in effecting a working agreement between the municipal tramways and the London traffic group. Under such an arrangement the Bill would be permitted to go through by agreement, thus enabling the County Council at some future date to acquire the privately owned undertakings, as was done four years ago in the case of Birmingham.

UNAUTHORISED STRIKES.

LONDON TRANSPORT DISORGANISED.

Glasgow, Belfast and London continued during the past week to be the centres of strikes organised in the first place by shipbuilding and engineering workmen, and spreading to other industries. In nearly all cases the strikes have been of the kind described as "unauthorised"; that is to say, they had no support from the trade unions concerned. The most important cause is the demand for shorter working hours, though the present hours have only recently been settled by agreement, and though ample provision was made for settling any outstanding points by conciliatory methods.

In London the local transit difficulty began on Monday with the closing down of the tube railways owing to a strike of motormen. The dispute was only about the half-hour meal interval—whether it should be counted in the new eight-hour working day or not. On Tuesday the strike extended to the Metropolitan District Railway and to the Chelsea Power Station. The inconvenience to the public, and particularly to the great masses of people who live in the suburbs and work in the central districts, was enormous. The tramways and omnibuses were of course quite unable to cope with the traffic at the rush hours. To add to the trouble, there was a heavy fall of wet snow on Wednesday, which produced much slush and discomfort. The stoppage of Chelsea Power Station brought the traffic on the Surrey lines of the London United Tramways to a standstill. The employees in the electric lighting stations threatened to strike, and the Government replied by issuing a new D.O.R.A. regulation which would make these men subject to fine and imprisonment if they struck. The Government were also credited with the intention of trying to provide drivers and firemen for main line steam trains should the strike extend to them. It did so extend on Thursday, when the services on the London and South Western and London and Brighton Railways were practically stopped. This followed on the Government refusing to receive a deputation from the locomotive men's society, the existing agreement for an eight-hour day having been signed as recently as January 30. The troubles of the public in getting about on Thursday were, of course, greater than ever, as very large numbers of people daily make use of the two systems closed on that day.

Late on Thursday night an agreement was reached between the President of the Board of Trade and representatives of the Locomotive Engineers and Firemen's Union. The latter agreed that men should be booked on for eight hours a day and that meal time is not included in the eight hours. The strikers have thus given in, but they have the saving clause that the general conditions of service are to be considered by the railway unions and the Railway Executive Committee.

In Glasgow at the end of last week, after the shipbuilding and engineering employees had struck work, a new development in "massed picketing" prevented many men who wanted to continue at work from doing so. Incited by extremist speeches, crowds of strikers broke out into riot. In conflicts with the police many people were injured, and despite the efforts of the civic authorities some

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damage was done to property. Some 15 tramcars were damaged on the streets. At length the aid of the military was called in, and, in face of troops with fixed bayonets, supported by machine guns and tanks, riotous action promptly vanished. Several strike leaders were arrested. Attempts were made to "get out" the employees of the tramways and electricity departments. In regard to the latter, there was for a time a shortage of current for lighting and for power in factories, but soon the services were restored. The attempts to call out the men in the tramway power station and the traffic staff were quite unsuccessful, and the service was maintained. The workers in the Coplahill car repair shops, however, joined the strikers. When that occurred, Mr. Dalrymple, general manager of the tramways, announced that the men who did not resume work on the following morning would be treated as being out of the service, and that they would be taken back only when and if required. The result was that of the 400 or so involved a considerable proportion (many of them unwilling strikers) returned. The firm stand by the authorities has been followed by many of the strikers in various works going back to duty. There have also been meetings of loyal trade unionists protesting against the strike.

In Belfast the tramway service remained out of commission through the stoppage of work in the power station, which began in the previous week.

L.C.C. TRAMWAY MATTERS.

At the meeting of the London County Council on Tuesday various reports from the Highways Committee, including an important proposal for the establishment of omnibus services, which is referred to elsewhere in this issue, were approved. Other reports, dealing with wages of workers at Greenwich power station, employees in the electrical branch, and breakdown hands, were also approved.

47-HOUR WEEK.—In view of the fact that a 48-hour week has been granted to railway employees, and a 47-hour week to engineering trades throughout the country, the Council agreed to accept the award of the Court of Arbitration providing for the institution of a 47 and a 48-hour week in the electrical branch of the tramways department, embodying the following principal points:—(1) A 47-hour week in the case of day workers; (2) a 48-hour week in the case of shift workers; and (3) the hourly rates to be adjusted as regards day workers in the ratio of 54 to 47, and in the case of shift workers in the ratio of 56 to 48.

SUPPLY OF TRAMWAY MATERIAL.—The issue of invitations was authorised for tenders from selected firms for the supply of ball bearings, cotton-covered copper wire, axle box springs, motor frames, bolsters, white metal, brake shoe holders, driving wheel centres, and plough lead cable.

NEW JUNCTION LINES.—It was agreed that the construction and reconstruction should be put in hand in the near future for two junction lines. The lines are those from Stockwell Road and Clapham Road, and between Tooting High Street and Mitcham Road. The former will provide a useful cross town route enabling direct services to be run between the existing tramways from King's Road, Chelsea, and the Plough, Clapham, and those from Brixton to St. George's, Southwark, which are considered indispensable to the efficient operation of the tramway service. It is hoped to obtain the early sanction of the Treasury for the expenditure required, which is estimated at £6,945.

SUPPLY OF STORES.—Accordingly a special vote was passed, increasing the amount for stocks in hand by £30,000. The value of stocks, including coal at Greenwich power station, up to March 31, 1918, amounted to £248,458, considerably in excess of the approved special estimates. This increase is attributable mainly to the greatly enhanced value of stores. During the war the maintenance of the permanent way and tramway cars has been reduced to a minimum, and as soon as men and material are available, this work will be greatly expanded, entailing a much larger supply of stores.

FREE TRAVEL FOR THE BLIND.—The Highways Committee reported that in order to avoid any misapprehension that might have arisen, there has been no departure from the decision that necessitous blind persons, properly authenticated and accompanied by a guide, should be carried free, and that the guide is charged the usual fare.

ACCIDENT CLAIMS.—During the three months ended December 31, 1918, the Highways Committee reported that they had sanctioned the settlement of 380 accident claims against the Council, the cost having amounted to about £3,418. In three other cases a verdict was given against the Council, in which £99 6s. 6d. in costs had to be paid. Three others resulted in the Council's favour, and one was withdrawn.

COAL FOR GREENWICH STATION.—During the quarter ended December 31, 1918, 36,366 tons of coal and 6,110 tons of coke were purchased for Greenwich power station, at a cost of about £80,950.

Sunday Services.—Nottingham Tramways Committee have decided to resume the running of cars on Sundays on February 9. The Sunday service was stopped owing to the scarcity of labour and of coal. The freeing of miners from the Army and the relaxation of the household fuel restrictions have induced the Committee to take the step, though the Coal Controller has declared that circumstances do not admit of development of the nature desired, and that increased services which demand additional supplies of fuel can only be given at the undertaking's own risk. The Coal Controller took up a similar attitude in the case of Sunderland, but the Tramways Committee there also recommend the resumption of the Sunday services.

MISCELLANEOUS NEWS AND NOTES.

A Halifax Extension Wanted.—Halifax Corporation have informed Stainland Urban Council that they will extend the Halifax Tramways to Stainland as quickly as possible, but owing to the shortage of labour and the high cost of material a definite date cannot be given.

Proposed Municipal Omnibuses for Stoke-on-Trent.—At a meeting of Stoke-on-Trent Council the Estates Committee reported that they had instructed the town clerk to take steps for obtaining Parliamentary powers to run motor omnibuses. The present omnibus service was regarded as inadequate.

Liverpool's Proposed Expenditure of £550,000.—Liverpool Tramway and Electric Power Committee propose that application should be made to the Local Government Board for sanction to borrow £200,000 for generating plant, £190,000 for electric mains, £70,000 for new cars, £65,000 for motor omnibuses, £15,000 for motor garage and equipment, and £10,000 for a new car shed; total £550,000.

Narrow Escape of Dartford Car.—On Tuesday, a Dartford double deck car left the rails on the bridge crossing the river at the foot of East Hill, and crashing through the iron railings of the bridge, collided with a tree. Several passengers were slightly injured. Had the car left the road a few feet further back, it would probably have fallen into the river.

Coal Economy at Rotherham.—The technical adviser to the Coal Controller has written to Rotherham electrical engineer stating that from a summary of the returns received during the six months ending September 30 last, he notes that the coal consumption per unit generally was 3·12 lb. as compared with an average of 3·75lb. for the complete year ending March 31st 1918. This reduction represented a saving of 3,762 tons of fuel during the six months, and he tendered congratulations on the increased efficiency obtained.

American Price of Tramway Rails.—The Metropolitan Electric tramway company in 1916, when British firms were at that time prohibited by Government from rolling tramway rails, ordered a small quantity of rails from the United States. At a recent meeting of the Middlesex Council it was stated that the price, including freight and insurance, was £30 per ton. This compares with a pre-war price in the British Isles of £7 10s.

Proposed Maidstone Extension.—Maidstone Town Council have passed a resolution to engage Mr. C. C. Hawtayne as consulting engineer in place of the late Mr. Stephen Sellon, and to instruct him to report on proposed extensions of the light railways in North and King Street Wards and to Chatham. It was mentioned that it would not be possible to begin the work of construction for two years, and that by that time the cost would probably be less than if such construction were carried out now.

Men from the Army.—There has been some newspaper talk within the last few days about an early relief of the congestion of London passenger traffic owing to the release of tramway, omnibus and underground railway employees from the Army. As a matter of fact, the number of men released for rejoining these services has up to the present been small. A much larger proportion is required in order appreciably to relieve the situation. Additional rolling stock also is needed, and its provision will take some time.

The Ministry of Transport.—Progress is being made with the drafting of the Parliamentary Bill to constitute a Ministry of Transport. As already indicated, it is expected that the Minister of Ways and Communications will take over the railway powers of the Board of Trade and all the functions of the Light Railway Commissioners, the Road Board, the Road Transport Committee and the Commissioners of Waterways. It is probable that an attempt will be made by the motor car interests to have a separate Road Ministry.

Proposed Renewals at Rotherham.—The town clerk of Rotherham has reported to the Town Council on an interview he had with a representative of the Local Government Board as to expenditure necessary on the tramways. He reported that the permanent way was in a bad state of repair and required urgent attention. About five miles of single track must be repaired immediately, and for the purpose of the 1915 Parliamentary Bill the estimated cost per lineal yard of new single track worked out at £3 16s. 3d., or approximately at £6,700 per mile, making a total of £33,500. Where renewals were carried out single tracks would be dispensed with, and double tracks laid down in their place, involving an expenditure of £50,000 instead of £30 000 for relaying the old track, and £60,000 would be required for a new five-mile single track. This had already been decided upon by the Council. The Town Clerk also stated that it was most desirable the tramway system should be extended to Wickersley.

CONTRACTS AND ORDERS.

Preston Corporation has purchased from Messrs. Hulse and Company, of Salford, a double car-wheel lathe for the car repair shop, the price being £900.

The British Westinghouse Company are supplying a 3,000 kw. turbine, condensing plant, etc., to Stoke-on-Trent Electricity Committee.

Cardiff Tramways Committee have accepted the following tenders: Boilers, Messrs. Babcock and Willcox, £9,455; feed pumps, Messrs. G. and J. Weir, Glasgow, £370; induced draught plant, Messrs. Musgrave, Belfast, £1,400; steel chimney, Messrs. John Thompson, Dudley, £805; fuel economisers, Messrs. Green and Sons, Wakefield, £1,745; and 4,250 yards of cable from the British Insulated and Helsby Cables Co. at £1,410 per mile.

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PERSONAL.

Mr. John Wiseman, Secretary to the Edinburgh and District Tramways Company, died suddenly on Thursday from pneumonia.

Messrs. Coote and Harris have been appointed by Bexley Council to represent them on the Metropolitan Municipal Traffic Council, which has been formed to take the place of the Metropolitan Association of Tramway Managers.

Mr. J. B. MacKinnon, traffic superintendent of the London United Tramways, has, on the resignation of Mr. W. E. Hammond, been appointed general traffic superintendent of the Metropolitan, the London United and the South Metropolitan Tramways.

Mr. A. Toms, London sales manager of the J. G. Brill Company, has been released from Government service and has now resumed duties at the London Office of the Company, 110, Cannon Street, E.C.4.

Mr. F. M. Foster, assistant engineer and manager of Norwich Electric Tramways Company, has been appointed engineer and acting manager in succession to Mr. F. W. Ketley, who recently resigned the management of the above company.

Mr. W. McClelland, O.B.E., has been appointed by the Admiralty Director of Electrical Engineering, succeeding Mr. C. H. Wordingham, C.B.E., whose resignation, as previously announced, took effect on January 1, 1919.

Mr. C. J. Spencer, general manager of the Metropolitan Electric Tramways and the London United Tramways, has also been appointed general manager of the South Metropolitan Electric Tramways and Lighting Company. **Mr. A. V. Mason** has been appointed engineer to the three companies.

Stephen Sellon and Partners.—We are informed that Mr. Stephen Sellon's practice will be continued by Messrs. Arthur R. Hoare and S. Rutter Fletcher, both of whom have been associated with Mr. Sellon for the past twenty years, with the same firm name and at the same address (36, Victoria Street, London, S.W.1).

FINANCIAL.

City of Buenos Ayres Tramways.—A balance dividend is declared of 1s. 3d. per share, making 5 per cent. per annum less, income tax, for the year ended December 31 last.

Scarborough South Cliff Tramway Co:—At the annual meeting of this Company on January 29, a dividend of 6 per cent. was declared and £113 was carried forward.

Guest, Keen & Nettlefolds, Ltd.—The directors have declared an interim dividend for the six months ended December 31, 1918, at the rate of 5 per cent. per annum on the preference shares, and 1s. per share on the ordinary shares, both free of income tax.

Metropolitan Railway Co.—A dividend has been declared on the ordinary stock at the rate of 1½ per cent. per annum for the past half-year, making 1¼ per cent. for the year, after placing £20,000 to general renewals fund and carrying forward £19,000.

London United Tramways Co.—Resolutions have been adopted approving the reduction of the company's capital from £2,500,000 to £656,250, divided into £125,000 preference shares of £5 5s. each, to be sub-divided into 21 fully paid shares of 5s. each, such shares to be converted into ordinary shares of 5s. each.

City and South London Railway.—The directors of the City and South London Railway Company recommend a dividend on the Consolidated Ordinary stock for the six months ended December 31, 1918, of 1¼ per cent., making 2 per cent. for the year, carrying £24,367 forward. A year ago the dividend was 1½ per cent. with £21,265 carried forward.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended February 5, amounted to £66,271; an increase of £13,491 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to February 5 (forty-four and a half weeks) the total receipts were £2,949,876, an increase of £499,778 on the corresponding period of 1918.

London General Omnibus.—The directors of the London General Omnibus Company recommend, subject to audit, a dividend on the Ordinary shares for the six months ended December 31 last of 4 per cent., making with the interim dividend of 4 per cent. 8 per cent. for the year, with £60,900 carried forward For the previous year the dividend was 7 per cent., £197,938 being added to reserve and £38,547 carried forward.

Central London Railway.—The directors of the Central London Railway Company recommend a dividend on the undivided Ordinary stock for the six months ended December 31, 1918, of 2¼ per cent., making for the year 4 per cent.; on the Preferred Ordinary stock of 2 per cent., making 4 per cent. for the year, and on the Deferred Ordinary stock for the year 4 per cent., leaving £17,485 to be carried forward. A year ago the dividends were 4 per cent. on the Preferred Ordinary stock, and 3 per cent. on the Deferred Ordinary stock, with £11,147 carried forward.

London Electric Railway.—The directors of the London Electric Railway Company recommend dividends on the Four per cent. Preference stock for the six months ended December 31, 1918, of 2 per cent., making with the interim dividend 4 per cent. for the year. On the Ordinary shares 1¼ per cent. making with the interim dividend of ¾ per cent. paid for the first half of the year a dividend for 1918 of 2 per cent., £23,604 being carried forward. A year ago the dividend was 1½ per cent., and £30,656 was carried forward.

Metropolitan District Railway.—The directors of the Metropolitan District Railway Company recommend dividends making for the year 4 per cent. on the four per cent. Guaranteed stock, 4½ per cent. on the 4½ per cent. First Preference stock, and on the 5 per cent. Second Preference stock for the six months ended December 31, 1918, 3½ per cent., making for the year 5 per cent., and carrying £21,331 forward. A year ago the dividend was at the rate of 3 per cent. £29,029 being carried forward.

Underground Electric Railways.—The directors of the Underground Electric Railways Company of London state that, subject to confirmation of the dividend announcements by the companies in which the company is interested, and subject to final audit, the revenue of the company will enable it to pay the interest to December 31 last on its Six per cent. First Cumulative Income Debenture stock, and to pay the full interest of 3 per cent., free of income tax, on its six per cent. Income bonds of 1948 for the half-year ended December 31, with a carry forward of £36,700. A year ago the payment on the six per cent. First Income Debentures was at the same rate, but that on the 1948 Income bonds was 4 per cent. for the year, £31,000 being carried forward.

Dublin United Tramways Co.—The report of the directors for the year ended December 31 last states that the amount available for division is £117,493. Interim dividends, amounting to £22,620, were paid on August 3, 1918. It is recommended that a dividend at the rate of six per cent. per annum, less income tax, be paid on the preference stock for the half-year ending December 31, 1918, and that a final dividend at the rate of six per cent. per annum, less income tax (making five per cent for the year), be paid on the ordinary stock for the same half-year, together with a bonus of one shilling (free of income tax) per £10 unit of ordinary stock; that £35,000 be set aside towards deferred renewals of rails and cars, £15,000 be added to general reserve fund, and £1,850 be written off price of investments, bringing them to their present market value. The dividends, bonus and sums set aside will absorb £104,230, leaving £13,263 to be carried to next account. The accounts show that the total receipts amounted to £461,156, as compared with £369,937 in the previous year. The expenses were £321,934 against £251,952, so that the balance was £139,222, against £117,985. The working expenses were equal to 11·13d. per car.mile. The number of passengers were 71,008,655, against 66,624,326, while the distance run was 6,787,654 car miles, against 7,732,897. The length of lines worked remains at 54 miles, while the cars, numbering 318, are 10 fewer than a year ago.

TENDERS INVITED.

CITY OF LINCOLN.

Electricity Department.

The Lincoln Corporation invite tenders for the manufacture, delivery and erection in Lincoln of the undermentioned plant, viz. :—

SECTION.

A. Four water tube boilers, with induced draught plants, stokers, and other auxiliaries.
B. Two 3,000 kw. turbo-alternators with condensing plants and auxiliaries.
C. Extension of extra high tension switchboard, and also exciter and other panels.
E. Two 750 kw. rotary converters with static transformers.
F. Two 2,000 k.v.a. 3-phase transformers, 6,600-3,300 volts.

Tenders will be considered for any of the above sections.

Specifications and other particulars may be obtained by manufacturers on application to the consulting engineers, Messrs. Preece, Cardew, Snell and Rider, 8, Queen Anne's Gate, Westminster, S.W.1.

Copies of the specifications can be seen at the office of the City Electrical Engineer, Mr. Stanley Clegg, Brayford, Lincoln.

Tenders upon the prescribed forms must be delivered at the Town Clerk's Office, Guildhall, Lincoln, not later than 11 o'clock noon on Wednesday, March 5th, 1919.

An official receipt must be obtained for any tender delivered by hand. Tenders sent by post must be registered.

The Council do not bind themselves to accept the lowest or any tenders.

DICK, KERR & Co.,
Limited,
ABCHURCH YARD, CANNON STREET
LONDON, E.C.,
ENGINEERS & CONTRACTORS.
Complete Equipment
TRAMWAYS & LIGHT RAILWAYS
at home and abroad

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POSITIONS VACANT.

COUNTY BOROUGH OF WEST HAM.

Tramways Department.

Permanent Way Superintendent.

The Council invite applications from qualified Civil Engineers for the position of Permanent Way Superintendent under the General Manager of Tramways, at a commencing salary of £250 per annum, advancing by two increments of £25 to £300 per annum, plus war bonus, which at present is at the rate of £65 per annum.

Applicants must have had practical experience in the construction and maintenance of tramway permanent way and the control and management of men engaged therein.

Experience in the construction and maintenance of overhead equipment will be regarded an advantage.

Application must be made on the official form, which may be obtained from Mr. M. L. Slattery, General Manager, Tramway Offices, Greengate Street, Plaistow, E.13, and must be delivered, together with copies of three recent testimonials, at my Office not later than 12 noon on Friday, the 14th day of February, 1919.

George E. Hilleary,
Town Clerk.

Town Hall, West Ham,
January 29th, 1919.

COUNTY BOROUGH OF SOUTHPORT.

Tramways Department.

Depot Superintendent.

The Tramways Committee invite application for the above position from fully qualified mechanical and electrical engineers, who have had a thorough experience in connection with tramway work. Salary £250 per annum.

Applications, stating full particulars of experience, together with copies of not more than three testimonials, must be delivered at my office, Town Hall, Southport, not later than noon on February 14, 1919.

(Signed) J. Ernest Jarratt.
Town Clerk.

Town Hall, Southport,
January 28, 1919.

COUNTY BOROUGH OF BELFAST.

Belfast City Tramways.

Assistant Permanent Way Engineer.

The Tramways Committee invite applications for the above position from fully qualified Civil Engineers (under 40 years of age) with practical experience in the maintenance, renewal and construction of tramway permanent way. Candidates must be accustomed to the control and management of considerable bodies of men and have a thorough knowledge of the requirements of a modern permanent way department.

Salary £350 per annum rising to £450 per annum by annual increments of £25.

Applications on the official forms, which may be obtained from Mr. J. S. D. Moffet, General Manager, Tramways Office, Sandy Row, Belfast, to be delivered at my Office, City Hall, Belfast, not later than 12 noon on Friday, February 21st.

R. Meyer,
Town Clerk.

Traffic Superintendents.

Two Resident Traffic Superintendents wanted for large tramways in London. Commencing salary from £350 per annum. Candidates must have experience in control of staff and in the duties of inspectors, motormen and conductors.

Applications stating age and experience, with copies of not more than three testimonials, to Box No. 19, The Tramway and Railway World, Amberley House, Norfolk Street, London, W.C.2.

Traffic Clerk.

Experienced Traffic Clerk required by large Provincial Tramways for Head Office Work.

Applications will be treated in strict confidence and should give full details of qualifications, experience and salary required.—Apply, Box No. 18, The Tramway and Railway World, Amberley House, Norfolk Street, W.C.2.

BINDING CASES

For half-yearly volumes of "The Tramway and Railway World" can be obtained from the Publishers, price **3s.**

READING CASES

To hold 26 Saturday Issues can be supplied at **3s. 6d.**

These cases are strongly bound and form a convenient means for filing copies for reference until the half-yearly volumes are completed.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAME.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C. ..	Jan. 28	493	522	+ 29	43	22,034	—
Aberdeen Corporation ..	„ 29	2,262	2,482	+ 220	35	913,138	+ 15,600
Ayr Corporation ..	Feb. 1	337	391	+ 54	37	22,653	+ 4,762
Birkenhead Corporation	„ 2	1,851	2,053	+ 202	44	96,379	+ 15,085
Blackburn „ ..	Jan. 29	1,638	1,588	— 50	44½	78,093	+ 2,468
Bradford Corporation .	Feb. 1	7,226	9,072	+ 1,846	44	407,928	+ 70,939
Burnley Corporation .	„ 1	1,938	2,484	+ 546	..	..	..
Burton-on-Trent Cor. ..	„ 2	376	399	+ 23	44	18,221	+ 4,083
Bury Corporation ..	„ 2	1,585	1,935	+ 350	44	89,929	+ 17,187
Chatham & District ..	Jan. 30	1,114	1,175	+ 61	4	5,106	+ 285
Cork Electric	„ 30	573	525	— 48	4	2,321	— 86
Derby Corporation ..	Feb. 1	1,306	1,403	+ 97	44	65,966	+ 12,294
Dundee City	Jan. 29	1,564	1,982	+ 418	37	72,421	+ 14,696
East Ham Corporation ..	Feb. 1	1,333	1,468	+ 135	43¾	68,829	+ 8,725
Glasgow Corporation ..	„ 1	26,610	27,868	+ 1,258	35½	1,008,550	+ 81,508
Glossop (U.E. Sup. Co.) ..	„ 1	181	211	+ 30	5	1,022	+ 153
Halifax Corporation ..	Jan. 28	2,316	2,668	+ 352	43½	122,858	+ 16,554
do. Motor Buses ..	„ 28	53	68	+ 15	43½	2,913	+ 773
Huddersfield Corporation	Feb. 1	3,143	3,528	+ 385	44	159,740	+ 20,828
Ilford U.D. Council ..	Oct. 12	713	1,000	+ 287	28	28,593	+ 6,779
Ipswich Corporation ..	Feb. 1	575	604	+ 29	44	32,899	+ 3,613
Isle of Thanet ..	„ 1	200	257	+ 57	17½	5,499	+ 2,469
Kilmarnock Corporation	„ 1	224	265	+ 41	37½	10,008	+ 2,293
Lanarkshire	Jan. 30	2,952	3,595	+ 643	4	16,579	+ 3,792
Leeds City	Feb. 1	10,728	13,734	+ 3,006	44	595,232	+ 111,742
Leicester Corporation ..	„ 1	4,215	4,863	+ 648	..	..	..
Leyton U.D. Council ..	Jan. 30	1,744	2,376	+ 632	44	104,455	+ 22,049
Liverpool Corporation ..	Feb. 1	16,689	19,361	+ 2,672	4½	90,684	+ 16,163
Llandudno & Colwyn Bay	Jan. 24	214	290	+ 76	8	2,381	+ 597
London County Council ..	Feb. 5	52,780	66,271	+ 13,491	44½	2,949,876	+ 499,778
Maidstone Corporation ..	Jan. 30	247	261	+ 14	43¾	12,488	+ 1,687
Manchester Corporation	Feb. 1	23,576	26,478	+ 2,902	44	1,147,510	+ 223,151
Newcastle-on-Tyne Cor.	„ 1	8,454	8,145	— 309	44	393,050	+ 47,294
Northampton Cor. ..	Jan. 31	866	957	+ 91	44	38,894	+ 1,821
Nottingham Corporation	„ 30	4,943	5,832	+ 889	44	252,355	+ 55,396
Oldham Corporation ..	Feb. 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation ..	Jan. 30	1,065	1,247	+ 182	43½	56,823	--
Rhondda Tramways ..	„ 23	1,472	2,113	+ 641	3	6,899	+ 2,178
Rotherham Corporation	Feb. 5	1,948	1,971	+ 23	44¾	102,158	+ 20,795
Sheffield Corporation ..	„ 2	12,851	12,368	— 483	44½	594,292	+ 50,396
Southampton Cor. ..	Jan. 29	2,230	2,197	— 33	43¾	110,233	+ 19,762
Southend-on-Sea Cor. ..	„ 29	674	1,033	+ 359	44	57,936	+ 19,135
South Shields Cor. ..	„ 4	1,072	1,154	+ 82	40	46,121	+ 7,881
Sunderland Corporation..	Feb. 1	1,933	2,344	+ 411	44	96,384	+ 14,606
Swindon Corporation .	Jan. 29	282	282	+ Nil	43¾	13,480	+ 1,581
Torquay Tramways ..	„ 23	629	743	+ 114	3	2,458	+ 404
Tyneside Trys. & Trmrds.	„ 15	705	840	+ 135	3	1,831	+ 136
Wallasey Corporation .	Feb. 1	1,437	1,879	+ 442	43¾	82,648	+ 13,542
Walsall Corporation ..	„ 1	1,079	1,211	+ 132	44	54,648	+ 10,639
Walthamstow U.D. Coun.	„ 1	1,096	1,252	+ 156	44	63,388	+ 9,860
Warrington Corporation	Dec. 12	678	814	+ 136	37	28,165	+ 7,418
West Ham Corporation	Jan. 30	3,534	4,478	+ 944	43¾	200,301	+ 40,252
Wigan Corporation .	„ 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-19	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Jan. 28	£49,151	£54,769	4	£192,999	— £16,416
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Nov. 10	3,405	3,570	32	27,090	+ 1,512
Brazilian Traction (Mlrs.)	Nov.	7,695,000	7,581,000	48	93,363,000	+ 9,232,000
Brisbane	Dec.	35,019	38,135	52	440,014	+ 43,675
British Columbia .. $	Nov.	525,629	612,893	21	2,727,030	+ 358,925
Buenos Aires Lacroze ..	Dec.	40,901	50,460	26	259,224	+ 28,748
Burmah Tram. & Light Rs.	Dec.	26,224	34,593	21	176,539	+ 40,719
Calcutta .. .. Rs.	Jan. 25	71,406	82,787	3½	314,541	+ 48,677
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Jan.	4,011	3,655	4	3,655	— 356
Cordoba	Aug.	14,233	15,734	21	79,054	+ 8,740
East India	Dec.	1,099	2,048	21	9,953	+ 3,680
Hong Kong.. .. $	Dec. 14	11,762	13,006	50	689,742	+ 18,333
Kalgoorlie	Sept.	3,063	2,947	39	25,070	+ 942
La Plata	Jan.	4,711	5,730	4	5,730	- 1,019
Lima	Nov.	37,249	44,948	48	479,952	+ 82,898
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Dec. 31	46,646	43,146	52	942,232	+ 94,912
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	— 83,969
Manila .. .. $	Nov.	159,000	214,292	48	2,090,630	+ 466,897
Montevideo	Dec.	34,025	38,441	8	70,139	+ 5,054
Pernambuco	Jan. 26	4,495	5,146	3½	19,625	+ 87
Peruvian .. .. $	Dec.	1,101,090	1,057,990	26	6,020,715	+ 67,555
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Dec.	5,438	6,188	52	71,992	+ 11,174
Shanghai .. .. $	May 29	24,611	24,708	21	523,298	+ 20,542
Singapore .. .. $	Dec. 28	13,201	13,838	52	723,661	+ 54,856
Toronto .. .. $	Nov.	1,052,000	1,071,106	48	11,716,181	+ 729,183
Winnipeg .. .. $	Nov.	305,881	283,721	48	3,252,863	+ 213,466

WANTED.

COPIES OF "THE TRAMWAY AND RAILWAY WORLD."

Issues of January 1 and 13, 1916, and August 16 and October 18, 1917, to complete files for binding.

Indexes to Vols. XI (Jan. to June, 1902), XIII (Jan. to June, 1903), and XXXVIII (Jan. to June, 1915).

Reply to Box 24, The Tramway and Railway World, Amberley House, Norfolk Street, London, W.C.2.

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THE Tramway & Railway World
WITH MOTOR TRAFFIC SECTION

Founded 1892. LONDON, FEBRUARY 13, 1919. VOL. XLV.

ELECTRIFICATION OF THE MONTREAL TUNNEL ZONE.

A PAPER PRESENTED TO THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

By WILLIAM G. GORDON.

The city of Montreal is divided into two principal levels; the commercial and financial quarter being on a plane only a few feet above high water, and the residential and shopping districts being at a height of about 75 ft. above the river. As the space between Mount Royal and the St. Lawrence River is limited, this district has become very congested. Business has largely forced the residence section up and down the river and around the mountain. The tunnel under Mount Royal was built with the idea of giving the Canadian Northern Railway, which property now belongs to the Dominion Government, an entrance into the heart of the city, and to render available a large area for residential purposes, only a few minutes by train from the main railway terminus.

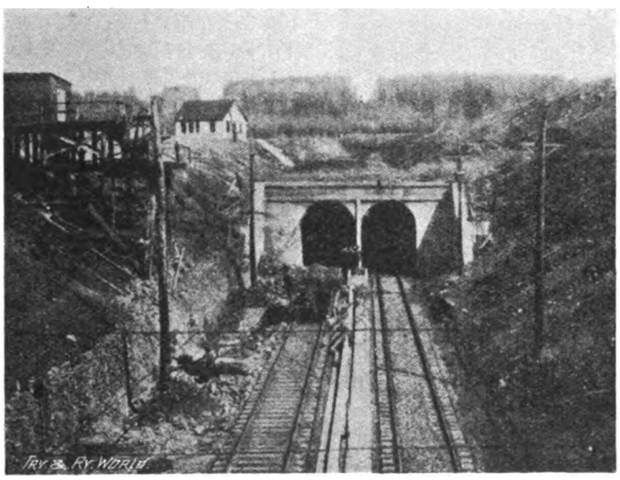

Fig. 1.—West Portal of Montreal Tunnel.

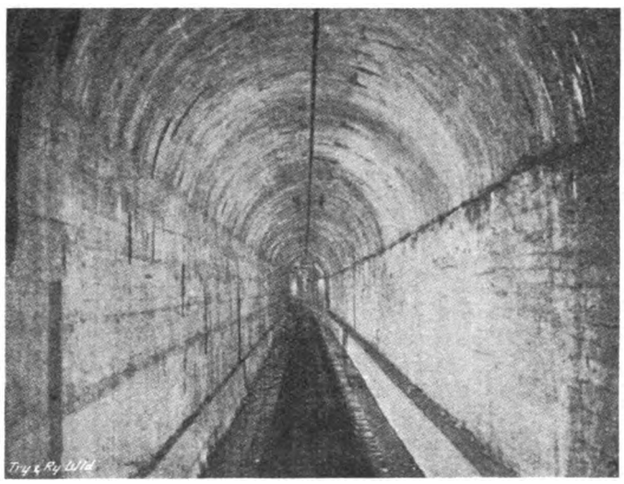

Fig. 2.—A Two-Degree Curve in the Tunnel.

The location of the present terminus is about midway between the two levels, and it is proposed to extend an elevated line, at the same uniform grade, which will connect up with the proposed viaduct on the lines of the Harbour Commission, thus giving direct access to transatlantic steamers and all the harbour facilities. The tunnel as built is 3·1 miles long, and is the shortest line that can be devised to take advantage of the geological formation. The tunnel has a uniform grade of 0·6 per cent. toward the city to insure proper drainage.

In order to meet the various physical conditions, different cross sections were used where hard sound rock, unsound rock and soft ground were encountered respectively. The twin section type of tunnel was adopted for (1) economy in construction, (2) ease and economy in ventilation, and (3) protection and safety in case of derailment or accident. In addition to working from both ends of the tunnel, a shaft was sunk one mile from the West Portal at Maplewood Avenue.

It is of interest to note that when the heading from the West Portal met that being driven from the Maplewood Avenue shaft, the lines checked within 1/16 in. on the alignment, and ¼ in. in grade, and that where the headings from the Maplewood Avenue shaft and that from Dorchester Street met under the highest point of Mount Royal, the error was ¾ in. in alignment and ¼ in. in grade.

The method employed in driving the tunnel was to drive a bottom centre heading about 8 ft. high by 12 ft. wide, as this heading could be driven ahead rapidly without much regard to the character of the ground, and from which the full size excavation could be developed at as many places, simultaneously, as desired. Four drills were used in each heading, supported on a horizontal bar; the drills being operated by compressed air at a pressure of about 100 lb. per sq. in. The break-ups, where the upper part of the tunnel section was excavated to its full width and height, were opened at intervals of from 500 ft. to 800 ft. along the centre bottom heading, the practice being to open up as many of these as necessary to keep up with the heading progress. The compressed air used for operating the drills and other pneumatic machinery was obtained from two plants, one at each

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end of the tunnel, with an aggregate capacity of 11,000 cu. ft. of free air per minute, compressed to 110 lb. per sq. in. The muck from the tunnel was handled by two 10-ton and one 8-ton trolley locomotives, and six 5-ton storage battery locomotives.

The load curve was worked up from the following data :—

TRAIN WEIGHTS AND SPEEDS ASSUMED FOR MONTREAL TERMINAL ELECTRIFICATION.

Class.	Trailing tons.	Speed level.	0·6 per cent. up-grade.	Schedule.
Transcontinental	1,130	37·0	26·5	21·2
Express and local	550	37·5	27·1	21·6
One motor coach	60	50·0	41·5	22·2
Three motor coaches ...	180	50·0	41·5	22·2
Three motor coaches and two trail coaches	260	47·8	34·8	21·8
Freight	1,000	32·5	23·5	—

Power is purchased from the Montreal Light, Heat and Power Company at 63 cycles, 11,000 volts, three-phase. It is delivered to the sub-station by a lead-covered, three-conductor cable carried in a duct through the tunnel, and also by an overhead line to insure continuity of service. The general arrangement and capacity of the switching equipment provides for the later addition of a steam auxiliary plant at the Back River near the Cartierville Yards for extension of the electrification of the main line to Ottawa. There are two motor-generator sets, with provision for a third later. Each of these sets consists of a synchronous motor direct coupled to and on a common bed-plate with two 750 KW., 1,200 volt, d-c. generators, the set running at 600 revolutions per minute. The generators are connected in series, giving 1,500 KW. at 2,400 volts per unit.

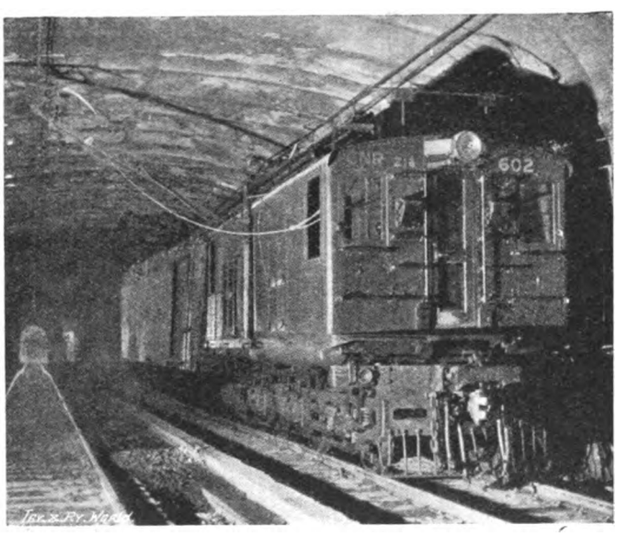

Fig. 3.—Locomotive Pulling in Messenger and Taking Current from Wire over Opposite Track.

The sets have an overload capacity of 200 per cent. for five minutes. The heavy overload capacity of these machines is obtained by the use of a pole-face winding. This winding of tubes and rods through holes near the pole faces is so connected as to directly oppose the armature reaction, thus insuring satisfactory operation up to the heavy overload mentioned. The pole-face windings and the series and commutating field windings are all connected on the ground side of these machines. The shunt fields of the d-c. generators and the synchronous motor fields are arranged for 125-volt excitation. Each of the synchronous motors is started by a three-phase, 11,000 volt compensator. This auto-transformer has one coil per phase with suitable starting taps brought out.

The three exciter sets each consist of a 50 KW. 125-volt d-c. generator driven by an induction motor. The generators are commutating pole type, flat compounded for the specified voltage, and are especially adapted for exciter work and voltage regulator control. A bank of six 100 KW. single-phase transformers supply the induction motors of the exciter sets and miscellaneous station requirements.

All oil switches on the 11,000 volt circuits, except the synchronous motor magnetising and starting switches, are enclosed in masonry cells and have two breaks per pole, each break in a separate tank. These switches have a rupturing capacity of 16,000 arc amperes at 11,000 volts. They are motor operated, and will open automatically on overload, the incoming line switches excepted, either instantaneously or with a time-limit action, as desired. The incoming line switches operate automatically on the reversal of power only. The synchronous motor starting switches are remote-control, solenoid-operated, mounted in cells, and have a rupturing capacity of 2,000 arc amperes at 11,000 volts.

The main switchboard is of three-section panels of natural black slate, 90 in. high. The 2,400 volt direct-current circuit breakers and lever switches are mounted on a panel back of and above the main switchboard. They are operated by insulated handles on the front of the main board, so as to eliminate any possibility of the operator coming in contact with the 2,400 volt circuit. The circuit breakers are mounted between fireproof barriers, and are equipped with powerful magnetic blowouts. The field switches are mounted on a base back of the panels, with the operating handles on the front of the main board.

There are six locomotives in operation. Each locomotive has four axles, with all the weight of the locomotive upon the eight driving wheels. The running gear consists of two four-wheel trucks, articulated with a heavy hinge. The equalisation of the trucks is accomplished by a semi-elliptic leaf spring over each journal box, connected through spring hangers to the frame and to the equaliser bars. The equivalent of a three-point suspension is thus obtained through the side equalisation of one of the trucks and both side and cross equalisation of the other truck.

The friction draft gear is mounted in the end frame casting of the truck. This type of construction restricts the hauling and buffing stresses to the truck side frames and articulated joint, thus relieving the cab and apparatus from the effects of severe shocks. The cab, which is of the box type, is divided into three compartments, the centre compartment for the apparatus, and the two end compartments for the operator. Each operator's compartment is supplied with controller, control switches, ammeter, air brake and pantograph control, air gauges, 2,400 volt cab heater, bell-rope, and control for the whistle and sanders, thus providing the locomotive with complete double end control. The motors are nose-supported in the usual way, and geared to the axle by means of twin gears, each of four-inch face.

The motor equipment consists of four commutating pole motors wound for 1,200 volts, and insulated for 2,400 volts, two of these motors being permanently connected in series for operating on the 2,400 volt trolley circuit. The one-hour rating of each motor is 320 H.P. at 1,200 volts. The motors are designed for forced ventilation, which is obtained by means of a

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blower in the locomotive cab. Either pair of motors may be cut out by a special handle on the change-over switch. The locomotives are geared for a free running speed on tangent level track of approximately 45 miles per hour, with ten points in series and nine points in series-parallel. The master controller used is of the non-automatic type, and has two handles, one regulating the applied voltage at the motors and the other controlling the direction of rotation of the motors. The rheostats which form the external motor resistance are placed near the roof of the cab, and provided with ample natural ventilation.

The master controller and contactor energising circuits are designed for 125 volts. Each contactor is easily accessible without any disturbance to adjacent contactors. A special electro-pneumatic change-over switch is used for making the transition between series and series parallel connection of the pair of motors.

The 125 volt current for operating the contactors and for lighting the cab and headlights is obtained from a motor generator set, the motor of which has two 1,200 volt windings and two 1,200 volt commutators in series for operation on 2,400 volts. This set is mounted in the centre cab. and also drives the blower for providing forced ventilation to the main motors.

Fuses of the copper ribbon type placed in the fuse-boxes provide protection for each individual circuit as well as the main circuit from the trolley. These fuse-boxes are all arranged to blow into a common chamber designed to take care of the arc. In addition to the fuse on the main circuit, a main switch is also provided. This is of the knife-blade type, being opened and closed by a handle in a position for easy operation in case of emergency, or when it might be necessary to open the circuit while carrying current. This main switch blows into the chamber provided for the fuses, and has a powerful magnetic blowout.

The trolleys are of the slider pantograph type, pneumatically operated and mounted on insulated bases. Two pantographs are used per locomotive.

A speedometer, similar to the type largely used on automobiles, but especially designed for locomotives, is located in each operating cab. These are connected to the driving wheels of the locomotive by means of flexible shaft and gearing.

A combined straight and automatic air brake equipment is provided on each locomotive. This equipment includes a 2,400 volt motor-driven air compressor, the set consisting of two 1,200 volt motors operating in series on 2,400 volts, and direct-connected to an air compressor having a displacement of 100 cu. ft. of free air per minute. The approximate total weight of each locomotive is 83 tons. Some of its principal dimensions and characteristics are given in the following table :—

Length inside knuckles	37 ft. 4 in.
Length over cab	31 ft. 0 in.
Overall height, pantograph down	15 ft. 6 in.
Height over cab	12 ft. 10 in.
Overall width	10 ft. 0 in.
Total wheelbase...	26 ft. 0 in.
Rigid wheelbase	8 ft. 8 in.
Total weight, on all drivers	83 tons.
Wheel diameter	46 in.
Tractive effort at 30 per cent. tractive co-efficient	49,800 lb.
Tractive effort at one-hour rating	20,300 lb.
Tractive effort at continuous rating ...	16,200 lb.
Speed at rated amperes, one-hour rating ...	23·4 miles per hour.
Total horse-power, one-hour rating	1,280 H.P.
Speed at rated amperes, continuous rating ...	24·6 miles per hour.
Total horse-power, continuous rating ...	1,090 H.P.
Gearing, 80–25 Reduction, 3·2.	

The multiple unit motor cars for handling local traffic are not yet in operation. The principal dimensions of these cars are given in the following table :—

Length over buffers	67 ft. 5¾ in.
Length over body corner posts	57 ft. 6¼ in.
Truck centres	42 ft. 9 in.
Width over side sill angles	9 ft. 10½ in.
Width over eaves	10 ft. 2¾ in.
Height top of rail over roof	13 ft. 0 in.
Height top of rail to underside of side sill	3 ft. 7½ in.
Centre to centre of body side bearings ...	4 ft. 10 in.
Centre to centre deck sills	5 ft. 6 in.

The approximate weight of the car loaded and equipped is 160,000 lb. The electric hot-air system of car heating is used. One complete heater is placed underneath each car, and receives its energy direct from the 2,400 volt supply. The heater has a capacity of approximately 25 KW., and is constructed for two heat combinations, so as to provide for the changes in temperature conveniently and economically.

The complete heating equipment consists of the heating unit, blower and regulating mechanism, the controlling switch and thermostat of the regulating mechanism being arranged for operation from the

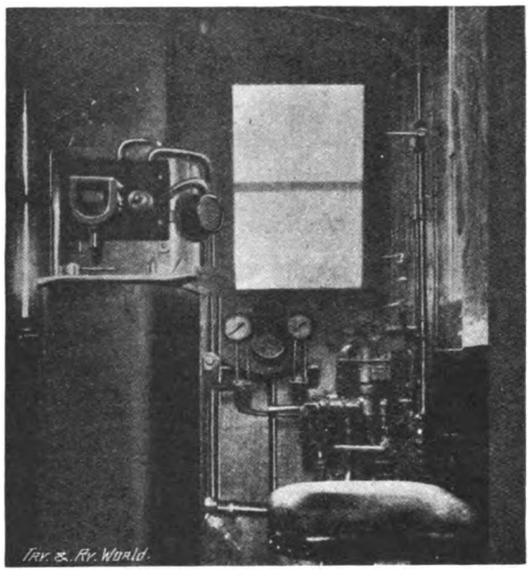

Fig. 4.—Control Apparatus in Locomotive Cab.

600 volt supply. Air is forced over the heating unit by means of the blower, and distributed to the car through the air ducts along the sides of the car. The blower used for the circulation of the air is operated by a motor which is connected in series with the heating unit on the ground side. The capacity of the blower is approximately 1,000 cu. ft. of air per minute.

The motor equipment consists of four fully ventilated, 125 H.P., 1,200 volt commutating-pole motors insulated for 2,400 volts. Two of these motors are permanently connected in series for 2,400 volts operation. Ventilation of the motor is accomplished by drawing air into the armature at the pinion end by means of the fan on the armature shaft. The air passes longitudinally through the whole interior of the motor, and is expelled through an opening in the frame at the commutator end, protected by wire mesh.

The control is of the non-automatic type for multiple-unit operation. The equipment includes a motor-generator set for furnishing 600 volt current for the control circuits, the air compressor, and lighting circuits. This set consists of two 1,200 volt motors, operating in series on 2,400 volts, direct-connected to a 600 volt generator. The master controller, con-

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tactors, switches, reversers, and pantograph are essentially the same construction and appearance as those already described for the locomotives. The controller has five steps in series and four steps in parallel. It differs from the locomotive controller in having the usual motorman's operating handle instead of a lever. This handle is provided with the so-called "dead man's" feature for cutting off power and applying the air brakes in case the motorman removes his hand. Copper ribbon fuses similar to those on the locomotive are used, and an aluminium cell lightning arrester is installed on each car.

Special local conditions and extremely low temperatures introduced features making the design of the catenary system for this electrification somewhat out of the ordinary. The electrified track at present is about 10 miles long, and in this distance there are a passenger terminal station and coach yard in the city, a double track tunnel, double tracks in a cut with low clearances under highway bridges, a long stretch of single track, both tangent and curve, and a large freight yard with repair shops and storage tracks. The temperature in the coldest winter weather reaches 35 deg. below zero, while in the hottest summer weather it will go as high as 110 in the sun. In the early spring severe sleet storms sometimes occur.

The poles are of Eastern white cedar. The specifications for these poles and also for the creosote oil used as a preservative, were based upon those of the National Electric Light Association. Steel poles are used in the terminal yard in the city on account of their more sightly appearance. The wood poles are set seven feet in the ground, and are all back-guyed. They are long enough to carry two cross-arms for feeders, signal circuit, and a three-phase transmission line for supplying the shops in the Cartierville Yard with electric power. On top of the poles there is a No. 000 copper ground wire, which serves both as a protection against lightning for the circuits on the poles and also as a preventive against any trouble that might be caused by breakage of the rail bonds, which latter are of the welded U type. The poles throughout the single track construction are spaced 150 ft. on tangents and 20 ft. on the 2 deg. curve. On the double-track portion, where the overhead clearance is limited, the spacing is reduced to 105 ft. on tangents.

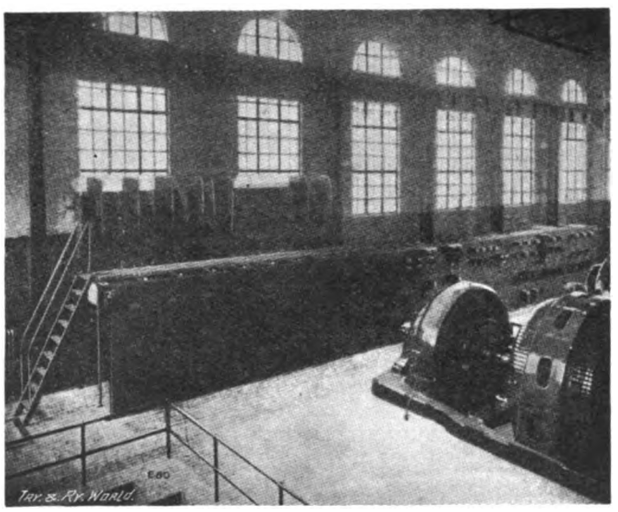

Fig. 5.—Interior of the Sub-Station.

The messenger for the electrification outside the tunnel consists of a ½ in. seven-strand Siemens-Martin steel cable, with an ultimate strength of 11,000 lb., and an elastic limit of 6,600 lb. Two No. 0000 copper feeders are installed on the full length of the electrification outside the tunnel, and the other for about one mile west of the sub-station.

The messenger is anchored every half mile. This is accomplished by running the end of one half mile length past the end of the next for a distance of one span. It is then made fast to an anchor eye on the bracket through an insulator and turn-buckle, and the same point of the bracket guyed back to the next pole, which in turn is guyed against this strain. The two messengers where they pass each other are kept from eight to ten inches apart. By anchoring the trolley wire on the same bracket the anchorage becomes a section insulation, the air space between the messenger and trolley wire forming the insulation. Where a section insulator is not required a copper jumper is placed between the messenger and trolley wires.

For the double-track portion of the line cross-span construction is used, the cross-span being a ⅜ in. seven-strand Siemens-Martin steel cable. The messenger is fastened to this by means of a small malleable clamp. This cross-span is made up with a turn-buckle, strain insulator, and wedge grip in each end, and fastened to the poles by means of eye-bolts.

In yard work spanning more than two tracks the construction is similar, but with the addition of a cross messenger of ½ in. cable above the ⅜ in. cable. This cross messenger is made fast to the poles directly, without insulators or turn-buckles, and carries the weight of the spans below through lengths of ¼ in. steel cable. These fasten to eyes in the tops of the messenger hangers, and to the cross messenger by means of Crosby clips. There is a strain insulator in each of these lengths.

Pull-offs are used on curves for holding the contact wire and messenger in the correct position over the track, and at intervals on long tangents for steadying the contact wire. The pull-offs are made of Sherardised steel tubing bent to avoid fouling the pantograph. Each pull-off is fitted with a clamp ear at one end and an eye at the other. Adjustable links are sometimes required with the pull-offs to keep the trolley wires the right distance apart at certain points, such as where the trolley wire for a turnout approaches the main trolley wire at an angle. Each link is composed of two malleable iron brackets, with clamp ears, connected by means of a ½ in. pipe, the length of which is adjusted between the brackets and held by set screws.

Porcelain strain insulators are used in two sizes. The larger, used with ½ in. and ⅜ in. steel cable, withstands a wet flash-over test of 14,000 volts, and has a breaking strength of 22,000 lb. The smaller, used with ⅜ in. and ¼ in. steel cable, has a breaking strength of 12,000 lb. The insulator used on the bracket construction is of the ordinary glazed porcelain, double petticoat, pin type, 4½ in. in diameter. It has a wet flash-over test of 20,000 volts. The messenger rests in the groove in the top of this insulator, and is not tied except on curves.

The contact wire is of special bronze composition, size No. 0000, with a breaking strength of 65,000 lb. per sq. in. and an elastic limit of 39,000 lb. per sq. in. Its section is the standard of the American Electric Railway Association for No. 0000 grooved trolley wire The use of this wire instead of hard-drawn copper was thought advisable both because of its longer life when subjected to the wear caused by sliding pantographs, and also because it could be pulled up tighter than copper on account of its greater strength. This

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latter reason was considered of special importance because of the wide variation in temperature in Montreal with the consequent great variation in the sag of ordinary copper trolley wire between winter and summer. The trolley wire is hung straight over the centre of the track as the natural side sway of the pantograph is sufficient to prevent wearing grooves in the contact strips.

The height of the trolley wire above the top of rail is ordinarily 23 ft. except along the double-track

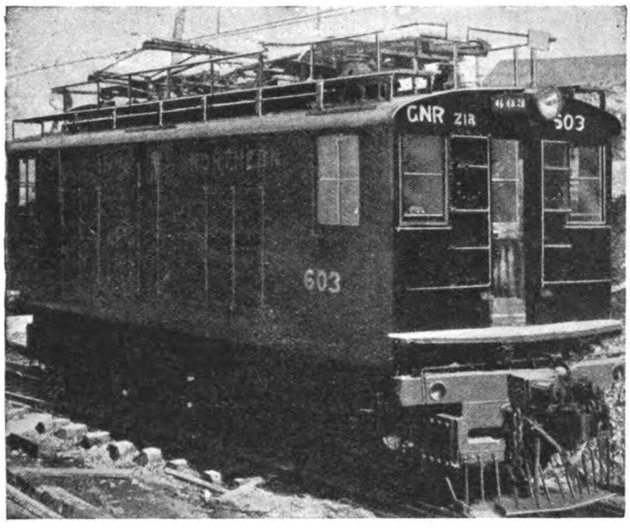

Fig. 6.—Locomotive Running under Low Catenary with Trolley Depressed.

construction and in the tunnel, where it is 16 ft. In this section two wires are used over each track. They hang side by side, supported from the same messenger, the hangers of one wire being staggered with those of the other. These double wires do not raise the hanger loops as high as would a single wire when a pantograph passes along, which is an obvious advantage where the head-room is limited. Sparking and consequent wear both of the contact shoes and contact wires is reduced to a minimum, as there is always good contact between the slider strips and one of the contact wires. The hangers are all of the long-loop type, having a malleable iron, single-bolt clamp ear, and a strap varying in length to suit its position. All parts are Sherardised. In spans of all lengths from 150 ft. to 90 ft. the hangers are spaced 15 ft. apart.

Lightning arresters of the magnetic blowout type are installed at half-mile intervals. The arrester is placed near the top of the pole, and the ground wire runs down the pole to a $\frac{3}{4}$ in. iron pipe driven about ten feet into the ground. Before driving this pipe, a 2 in. pipe was driven down about 5 ft., then withdrawn, and the hole filled with rock salt. The $\frac{3}{4}$ in. pipe was driven down through the salt. In addition to these arresters on the poles, aluminium cell arresters are installed in the sub-station on the positive busbars and on each feeder.

In order to string the messenger cable with the proper tension a dynamometer was used. It was therefore necessary for the foreman of the line gang to know what the tension should be at different atmospheric temperatures. The right sag at any given temperature was also of importance as a check on the tension. This information was supplied in the form of tables to which the line gang worked, the sags and tensions being given at 5 deg. intervals.

In the tunnel the overhead clearance was so limited that the catenary had to be very flat. This meant pulling the messenger up very tight for spans of reasonable length. A cable of phosphor bronze was decided upon, composed of nineteen wires, and having an overall diameter of 0·888 in. This cable has an ultimate breaking strength of 22,000 lb. and an elastic limit of 18,600 lb.

This messenger is supported every 90 ft. from the roof of the tunnel by a combination of iron yokes held in the concrete by four 1 in. bolts. The cross yoke carries the messenger insulator, and is supported on two insulators carried on the two end yokes, so that there are two insulators between the messenger and the ground. The insulators are of glazed porcelain, and have a wet flash-over test of 20,000 volts. All clamps and small parts of the messenger supports are of malleable iron Sherardised. The yokes are of 2 in. by $\frac{5}{8}$ in. and $1\frac{1}{2}$ in. by $\frac{7}{8}$ in. mild steel, painted with an asphaltum compound as a protection against rust. Two No. 0000 phosphor-bronze contact wires hang side by side from the messenger. The hangers for each contact wire are spaced 15 ft., or 7 ft. 6 in. between adjacent hangers. The hanger lengths vary from 6 in. to $13\frac{3}{4}$ in., with a 90 ft. span. The two hangers nearest the messenger support, namely, those $11\frac{1}{4}$ and $13\frac{3}{4}$ in. in length, are made with two loops one sliding inside the other, where the clearance to the roof is small. The remaining hangers are similar to those used outside the tunnel, except that the loop is wider in order to take the larger messenger. It was found that the two messenger cables and the four contact wires over the two tracks in the tunnel would give ample conductivity, so that no feeders through the tunnel were required. Both the messenger and contact wires are anchored every half mile. Two "bridles" of $\frac{1}{2}$ in. steel cable are fastened to the messenger by means of six $\frac{7}{8}$ in. Crosby clips, and the ends of these bridles fastened each way, through two cemented-type strain insulators in series, a turn-buckle and wedge grip to roof plates. The contact wire is anchored by lapping the ends for a distance of one span, and then carrying each end up and slightly to one side

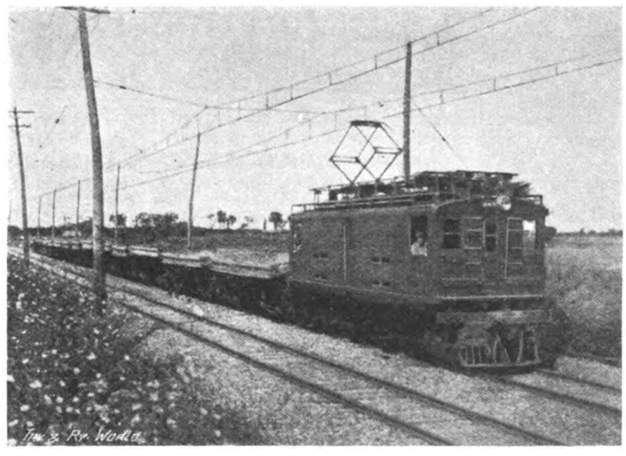

Fig. 7.—Catenary Construction on Straight Track.

of the centre, making fast to a roof plate through two insulators, a turn-buckle, and a wedge grip.

At the only curve in the tunnel, one of 2 deg., two pull-offs are placed in each span, over each track, one for each of the contact wires. The pull-offs are fastened to the tunnel arch through two strain insulators in series by means of an expansion bolt. The two pull-offs are placed 7 ft. 6 in. apart, and this arrangement prevents hard spots and at the same time keeps the two contact wires close enough together for satisfactory operation.

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AMERICAN STANDARD TRAMWAY CAR.

Soon after America entered the war, the War Board of the American Electric Railway Association appointed a committee to devise plans for a standard street railway car, and toward the end of last year the designs were published. The committee held several meetings at Washington, made a thorough examination of various plans and specifications, and finally approved a type of car which they considered would best meet the requirements of the United States Bureau of Industrial Housing and Transportation, of the public, and would be acceptable to the representatives of the companies and the car builders.

As will be seen from the drawings which we reproduce, the standard car is of the double truck, single-deck type, with vestibule ends, and is so arranged that it can be run as a single car or coupled in trains. Entrances and exits are provided at the ends and in the centre, where the floor is brought within 14 inches of the rails, so that passengers can step directly from the floor of the car to the street level.

The car illustrated is so designed that it can be operated by one or two persons. The War Board strongly advocated the adoption of a one-man type of car wherever practicable, and it made a detailed report on the success of its operation in numerous cities. Organised labour in some instances had opposed the use of this type of car, and it was the object of the report to demonstrate the necessity of using this type of car to meet certain conditions, and to show how it can be operated by one man.

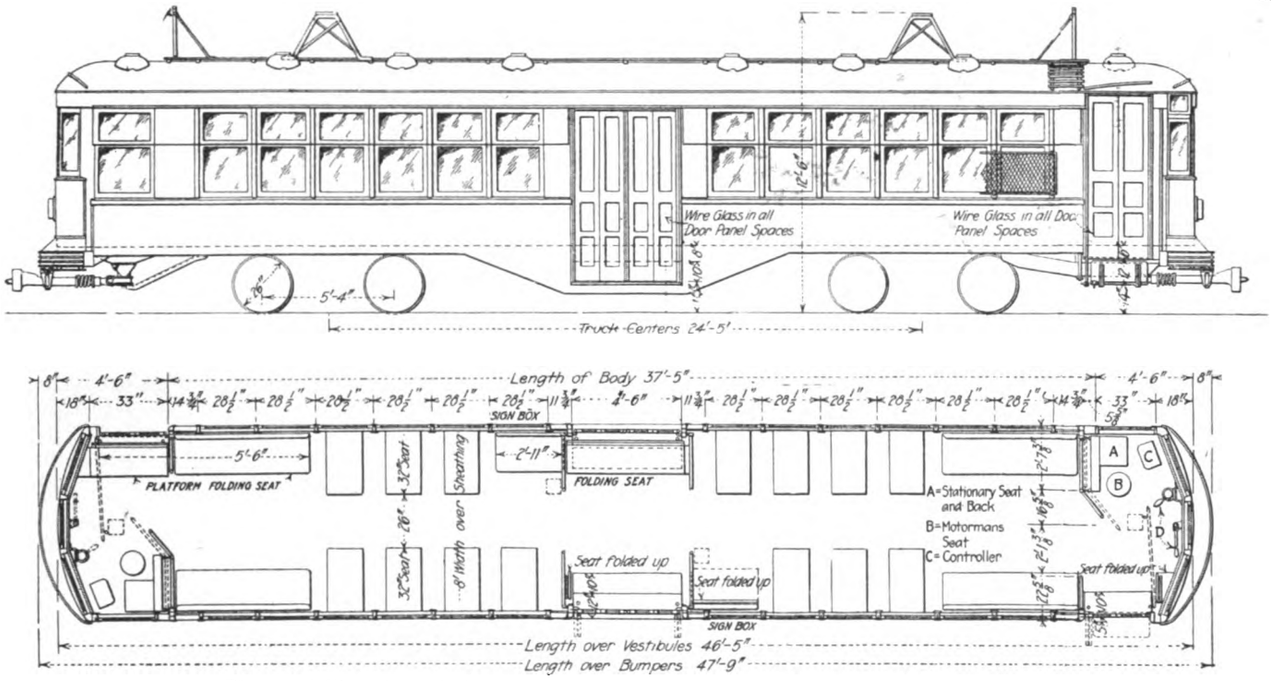
The car, as described by the *New York Electric Railway Journal*, is 47 ft. 9 in. long over all and 8 ft. 2 in. wide over all. It is expected that these limiting dimensions will give the necessary clearance in the cities where this car is likely to be used. The end platforms are 4 ft. 6 in. over the dashes with a clear entrance of 30 in. The side door has a clear opening of 48 in. The platform floors are on the same plane as the body floors, thus calling for three entrance steps as follows when a 26 in. wheel is used :—From ground to first step, 14 in.; from first step to second step, 12 in., and from second step to floor, $6\frac{5}{8}$ in.

The exit steps at the side are as follow :—From the floor to first step, $8\frac{5}{8}$ in.; from the first step to the second, 10 in.; and from the second step to street, 14 in. These latter steps are fixed and within the car.

As it was the intent of the bureau to get a car for average rather than for exceptionally congested conditions, a comparatively short platform is used. From a constructional standpoint, this would mean a reduction in weight and maintenance ; nor is the shorter length an operating disadvantage because, after all, the throat of the platform at the fare box and the seating arrangement are more important than the width of the steps. Weight and cost are also saved by the use of flush platform floors.

Further to save weight and reduce accidents, all ramps and wells have been avoided. The passenger who uses the side door steps directly from the car-floor level to the exit steps on the side of the car.

Since the car is arranged for double-end operation, the seating plan necessarily is symmetrical, although the car end may be used on both the pay-as-you-enter and pay-as-you-leave plans. The seats adjacent to the platforms are longitudinal, while the rest are transverse. Folding seats are provided in staggered relation to the side doors, one for three passengers and one for two. Other folding seats are available according to the direction of running.



Plan and Elevation of the Standard Tramway Car of the American War Board.

As a single-end one-man car the seating capacity is 61, as three permanent seats can be added to the rear platform. As a double-end one-man car, the seating capacity is 58. As a single-end two-person car, the seating capacity is 56, while as a double-end two-person car it is 53.

Transverse seats have been applied wherever they could be used without interfering with the flow of traffic. The seats are 32 in. over all, but their actual seating space is 35 in., because the seats are set 3 in. from the wall of the car. Should the cars be used in a climate demanding no heat insulation, the aisle width between the cross seats would be 26 in. instead of $24\frac{1}{2}$ in. The seats will be made of wood, steel, and rattan.

All doors are of the folding type, air operated, and hung on ball-bearing type hinges. The end doors

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are of the single folding type, with two leaves, and the centre doors are of the double folding type with four leaves. All doors have rubber cushions, and the lower panels are glazed in wire-glass. Among the reasons for operating the doors by air are the elimination of manual labour, the quicker action of the doors, the increased efficiency of fare collection, and the decreased likelihood that cars will ignore would-be passengers.

The arrangement of steps, doors, and seats is adapted to any kind of fare collection desired. If the car is used for heavy terminal loading at a prepayment area, passengers are at liberty to enter through one front and two centre passageways, totalling 6 ft. 6 in. If used as a pay-as-you-enter car, passengers will enter by the front platform, and pay as they pass the conductor, who is stationed forward of the centre door. In emergencies every door on the car can be unlocked. As these cars are likely to be distributed among different companies, no attempt has been made to specify the mechanical details of fare collection.

The total weight of the car, completely equipped, is estimated at 34,700 lb. using four 40 H.P. motors, multiple-unit control, couplers and other train-operating apparatus; or 30,700 lb. if equipped with four 25 H.P. motors and arranged for single-car operation only. In view of the decreased weight of these cars compared with preceding types of like capacity, their schedule speed with motors of the powers mentioned will tend to run about 10 per cent. higher. The air brakes will include safety control equipments, whereby control, brakes, doors, steps, and sanders will be interlocked as on the standard one-man safety car. Electric heating and thermostatic control are specified, the number of heaters to vary with climatic conditions, but usually ranging from eighteen to twenty-four. Ventilation will be provided through sixteen exhaust ventilators of approved type. The lighting circuit will comprise five circuits of 23-watt Mazda lamps, with two circuits so ranged that either headlight can be turned on or off from either end of the car. Push-button buzzer signals will be available for the passengers.

Buttons will also be provided in al control stands for signalling between the motorman and the conductor or conductors. All wiring will be placed in a flexible, featherweight conduit.

The car will have straight sides, round vestibules, arch roof, all floors on one plane, folding doors and steps on right-hand side of each platform, folding doors and stationary steps on each side of centre of car, open bulkheads and two sashes per window opening with top sash stationary and the lower sash arranged to raise. The general construction of the body is steel of commercial shapes with wood finish. Side posts and carlines will be formed as continuous pieces from sill to sill. The roof boards will serve as the ceiling.

The underframe will consist of standard commercial shapes. Two centre sills will extend from the body bolster to the bumper. Because of this through construction, a sectional end sill reinforced underneath with a channel iron will be used, all be ng tied together with a gusset plate. Diagonal braces will extend from the gusset plates to the ends of the vestibule. Diagonal braces will also be used between the drawbar fulcrum and side sills of the car. The ends of the car will be fitted with anti-climbers.

The reinforcement at the side openings consists of the usual cross-sill plus a channel iron which forms an arch from side sill to side sill. The pier panels at the side doors are reinforced inside with an extra plate. The letterboard is made of steel reinforced at the top with angle irons to give the necessary strength. The side girders are of No. 12 sheet steel, rivetted to the side sills, seat rest, and window rest angles, and to the T-posts. At splices there is a plate on each side. The dropper bar is rivetted through the window rest angles. The inside of the car will include a truss plank extending from the floor to the seat-rest angles, and a composition board will be placed between posts extending from the seat-rest angle to the window-rest angle. An air space is provided between the truss plank, the composition board lining and the outside steel girder. As the cars must be adapted to the greatest variety of overhead clearances, it was thought advisable to keep the roof low. Hence the proper height of trolley base, where necessary, is to be obtained by using the elevated stand of angle iron now so familiar through its common use on the safety car. The use of the stand also tends to reduce the noise of the trolley, and saves the roof ventilators from being damaged by trolley poles.

Single-thickness car flooring of yellow pine will be used, with $\frac{5}{8}$ in. maple floor strips on the platforms and in the aisles. Besides their use on all steps, safety treads will also be set in flush in the flooring at all door openings.

The trucks will be of the swing bolster type, having an interposed spiral spring above the plate spring and provided with a bolster guide. The wheelbase will be 5 ft. 4 in. and the wheels 26 in. Truck centres are 24 ft. 5 in. apart.

LONDON TRAFFIC COUNCIL.

ACTION BY MUNICIPAL TRAMWAY MANAGERS.

A Municipal Traffic Council for Greater London has been formed. Meetings of municipal tramway managers of the undertakings in the metropolitan area have been held, at which the question of the present and future position of passenger transit facilities in and around London was discussed, and consideration was given to the expediency of taking joint action to promote the interests of the undertakings concerned.

With this end in view it was decided :—

(1) That the Metropolitan Association of Tramway Managers, which included in its membership managers of both municipal and company-owned tramways, should be dissolved.

(2) To recommend that a new association, to be known as the Metropolitan Municipal Traffic Council, be formed, and—

(*a*) That such council consist of municipal authorities owning and working tramways and/or motor vehicles.

(*b*) That the municipal authorities be represented by not more than two members of each authority and the managers of the undertakings concerned.

(*c*) That meetings of the council be held quarterly.

(*d*) That meetings of the managers be held at least once in each month.

(*e*) That under the proposed constitution the managers to act jointly in an advisory capacity to the council on all matters which affect the common interests of the undertakings in the metropolitan area.

These proposals have been forwarded to each of the municipal tramway authorities in the metropolitan area, with a request to appoint representatives to attend a conference to consider the question.

New Cars for Toronto.—The Toronto Railway Company are equipping their entire system with the latest type of p.a.y.e. vestibules. The latter are provided with folding doors and folding steps, which are worked pneumatically from a lever placed convenient for the conductor, who stands in a small railed-in compartment, where there is a p.a.y.e. fare-box and a push button to signal the motorman. The motorman does not start until the signal lamp glows. When it goes out he throws off the power and applies the brake. The danger of the doors closing too rapidly and catching passengers in leaving or entering the cars is obviated by two strips of rubber tube attached to the doors. Any object caught between the doors merely receives a slight pressure. The *Canadian Electrical News* of January 15, which contains an illustrated description of the cars, says that they are the result of an investigation of the most efficient types in use in America.

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LONDON, FEBRUARY 13, 1919.

Revival of Tramway Construction Work.

A cheerful feature of the opening weeks of this year has been the considerable number of tramway authorities in this country that have advertised for tenders for new cars and omnibuses. They satisfied themselves before they asked for bids that the manufacturers are now in a position to fulfil their wants, although it is not expected that delivery will be rapid. This indicates a gradual return to pre-war conditions. The demands of the military authorities on engineering firms and on iron and steel manufacturers have now so slackened that probably a great increase in output for civilian purposes will soon be available. Moreover, besides the men released from munition work, the number of soldiers released from the army is becoming so great that the labour shortage must soon be much less troublesome. Things promise well in fact, were it not for the constant menace of labour troubles. It is worth noting that the new call for additional rolling stock was in the first place for omnibuses, the reason being that much earlier delivery of these could be promised than in the case of tramcars. That stage appears already to be over, and tenders for cars are now being freely invited. It is amusing to note, by the way, that in some quarters it appears to be thought that it is a new development for tramway undertakings to ask for omnibuses in order to supplement their tramway services. It is not a new feature, but it is more prominent at present because of the urgent necessity for additional means of transportation. The great increase of passengers during the war still continues, and every means of local communication is strained to its limit. There are great arrears to make up both in cars and omnibuses. Prices must, for some time at least, continue high, but renewals, additions, and extensions are urgent. That remark applies also to track repairs, and as soon as plenty of labour is available, hundreds of miles of new rails will have to be laid down, no matter at what cost. There is every prospect of an increasing supply of rails before long, but there is no prospect of prices returning to anything like pre-war level for a long time to come. Manufacturers of tramway supplies and materials have probably better prospects immediately in front of them than the operators of tramways have. What the latter require is a continuance of heavy traffic and of increased fares, together with some more or less permanent settlement of the labour trouble which has for some time been so menacing.

Railways v. Automobiles.

It is a remarkable fact that the proposals of the Ministry of Reconstruction for the provision of a system of narrow gauge light railways for the benefit of agriculture should have provoked an outburst of wrath from certain automobile interests in the country. For some more or less mysterious reason there is a section of the automobile interest on whom anything in the nature of a railway or a trmway seems to produce an effect like that of a red rag on a bull. The real fact is that in the development of the country there is ample scope both for light railways and for the use of motor wagons and lorries. Delimitation of spheres and arrangements for the one system helping the other so as to form parts of a general scheme are quite capable of arrangement. For the main work of hauling large quantities of goods and produce over considerable distances, there can be no doubt that cheap, narrow gauge light rail-

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ways possess advantages over the motor lorry. The latter ought to come in for local extension and branch work, and should prove a valuable auxiliary. The Ministry of Reconstruction, before preparing their memorandum in favour of "agrails," considered the alternative of road motor vehicles, and for the main purpose preferred the railway. They made one significant remark as to the likelihood that in the near future the owners of heavy motor vehicles will have to contribute substantially to the cost of upkeep of the roads they use. At present, while the railway maintains its own track, the motor wagon has its track provided and maintained at the cost of the ratepayers. Which would the latter prefer—a train of narrow gauge trucks running on rails laid on the roadside waste, or a "fleet" of heavy motor wagons wearing out the roads? One train on the railway will carry as much as many motor wagons, and it will require only one steam engine or electric locomotive, instead of many petrol or steam engines. Something of the attitude of mind of the critics may be gathered from the remarks of a writer in a weekly general newspaper. We are told, for example, that the light railways take away from their legitimate use a proportion of the highways to make them into railways. It is obvious, of course, that any part of these light railways which is laid on roads will require to have the rails flush with the surface, as in the case of a tramway. It is claimed as an advantage for the motor lorry that it can be taken off a non-paying route and transferred to a better without trouble or expense. That gives the case away. The light railways are to be provided for the development of agriculture. If some of them do not pay, they are still to be operated, so that agriculture may continue to be benefited, and the loss is to be made up from the profits on the lines which do pay. It is to be a comprehensive scheme, not a congeries of motor lorries running only on routes which pay the owners. It is also said that the use of the motor lorry involves no extra cost for permanent way. Precisely. The farmer who is supposed to benefit is to pay for the permanent way, which happens to be the public road. Readers may be recommended to study the opinion of such an authority as Sir Evan Jones, chairman of the Road Transport Board, as revealed in his evidence before the House of Commons Select Committee on Transport. It is full of impartial wisdom.

The Future of London Traffic. With the passenger services and the related subject of housing accommodation forming the most prominent questions to engage the attention of the electors in the election of the London County Council next month, the proposals of the three parties appealing for support are of much interest. Labour, which has only three representatives on the present Council, advocates public ownership of omnibuses, cabs, railways, etc. For the Progressives, the Rev. J. Scott Lidgett adheres to the proposal of a municipal highways and traffic authority which in the past has been responsible for causing more than one Government to refrain from carrying out the recommendation of the Royal Commission for the creation of a Traffic Board. He also insists "that such large powers of control over motor omnibus traffic must be obtained as will prevent the present wasteful and dangerous competition and utilise all possible means of locomotion for the convenience of the public." Further, Dr. Lidgett urges that the tramways must be developed and completed, following the abolition of the veto of the Borough Councils, and that pre-war fares and facilities must be restored. How the latter desideratum is to be accomplished in the face of vastly increased working expenses and the further cost of granting any of the concessions claimed in the employees' national programme, Dr. Lidgett does not explain. In this respect the Moderate party stand on firmer ground, in that their manifesto promises restoration only to the extent that will prevent the tramway undertaking becoming a charge upon the rates. The party now in power also intend "to develop the system in order that it may be worked with the maximum efficiency and convenience to the public." This means that efforts will be made to secure the carrying out of the proposals made a year or so before the war for the abolition of dead ends and for the construction of further extensions. Evidence of the party's sincerity in this respect is shown by the Highways Committee's report presented to the Council on February 5, but the difficulty

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of making extensions while the cost of materials remains at the present inflated figures is likely to delay the schemes. They further point out that uncertainty is inseparable from proposals which require the consent of the road authorities. The obstructive veto would doubtless be one of the subjects to be tackled by the Royal Commission or the Government Committee which the Moderate party urge should be set up to report upon the question of giving to London and the adjoining areas a unified form of government. The manifesto declares that under the present conditions it is impossible to deal efficiently and economically with a number of questions. Of these matters traction and housing facilities stand pre-eminent, and must be dealt with at once. An effort is being made to solve the problem on voluntary lines, as is shown by the recent formation of a non-official committee to devise plans for a Traffic and Development Board for London and the Home Counties. If, as is not unlikely, this dual question is taken in hand by Sir Eric Geddes, the Minister of Ways and Communications, the co-operation of all interests will be imperative if the capital and the surrounding country is to be given adequate traction facilities. That necessity no doubt animated the mind of Mr. G. H. Hume, the chairman of the London County Council Highways Committee, who is a member of the committee referred to, when he remarked to an interviewer that "tubes, tramways, and omnibuses at present are operated on the strictly individualistic method, and the Council will be asked to press for a reconsideration of the problem by the Government."

New Attributes of the Omnibus.

The extensive use that provincial tramway undertakings have made of the motor omnibus has proved the claims which have been advanced for that vehicle in these columns and at numerous conferences. The war has served to accentuate its merits, and now that the winning of freedom for the world enables tramway proprietors to devote attention to the restoration of tracks and cars, further claims are being made for the utility of the omnibus. Managers have assembled in queues at the offices of manufacturers, but find that no dates can be named for the delivery of the new cars so urgently needed, while prices have more than doubled. New cars are required not only to enable the needs of increased traffic to be met, but to replace worn stock and to open up services on extensions the construction of which is long overdue. Faced by these obstacles, tramway operators are turning to the motor omnibus, which can be obtained with comparatively little delay. The chassis now procurable has the advantage of embodying improvements wrought by the severe war test, and the price has not appreciated to the extent experienced in the case of cars. Beyond this advantage which the omnibus offers for certain traffic in an emergency, there are other attributes that have arisen out of the situation created by the war. These claims are of so vital a character that they have led the Highways Committee of the London County Council to recommend that application be made in the ensuing session of Parliament for powers to use omnibuses for the linking up of dead ends of the tramways and the provision of similar means for joining up termini with outlying districts. The popularity of the omnibus upon both suitably and unsuitably paved roads in the metropolitan district is proof that the public will welcome such a service. Before the tramways were brought over the bridges private interests prevented the Council obtaining power to provide horse omnibuses for linking up the southern and northern lines; but it is difficult to conceive of the present application not securing assent, if reasonable efforts to arrive at a working agreement with existing omnibus interests fail. The committee's reasons for promoting the Bill are in themselves the finest tribute to the motor omnibus. The first is, in the words of the Highways Committee, that the war has been responsible for a new financial consideration, viz., the increased cost of tramway construction. Next the committee state that the omnibus provides the practical way of meeting the requirements of the public with the least possible delay. Another reason is that the war has entailed four years' delay in the linking up of dead ends by means of tramway extension. It is also observed that the provision of omnibuses on trial routes is a necessity for the tramway undertaking in connection with districts which are being slowly developed, and

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that unless adequate services can be provided, pending the construction of tramways, the extensive housing policy shortly to be inaugurated may be seriously affected. It is because housing development must in the main take place outside of the county boundary that powers are to be sought to work omnibuses in the districts beyond the tramway termini, which, without exception, are likely to be several miles from the new settlements.

THE "AGRAILS" SCHEME.

Some further reference may be made to the scheme for the construction of light railways of narrow gauge in agricultural districts which was explained briefly in our issue of January 16. The evolvers of the proposal are the Ministry of Reconstruction, and to them is due the suggestion that the lines should be called agrails. The object of coining this word is to distinguish the proposed light railways from all other sorts of railways, tramways, and tramroads. It may be recalled that the form of construction contemplated is neither a light railway nor a tramway in the ordinary sense. The track would be a kind of tramway of 2 ft. gauge, cheaply constructed and easily laid and lifted. It would be laid on roadside wastes and on the road itself where necessary, and only to a limited extent on private land. The capacity of the wagons would be increased by building them with a considerable overhang. Passenger cars would be run, but the primary purpose of the agrails would be the carriage of agricultural supplies and produce, coal, road materials, etc. A maximum speed of 20 miles an hour is suggested. The traction would be by steam or electricity, according to local conditions, and where the rails are carried into sidings on farms, petrol tractors or horses would draw the wagons.

The scheme which has been worked out involves the formation of a body to be called the Agrail Board, representative of the Board of Trade and of agriculture. This Agrail Board will promote and construct the lines and lease them to companies for operation. Details as to finance are not yet settled, but among possible alternatives is one under which the cost of construction would be met jointly by the Development Commission and by the local authority. The working expenses would, of course, be met by the operating companies.

A crucial matter is the acquisition of land. The difficulty and cost of acquiring land for public purposes has always been a stumbling block. In England a price of about 10 per cent. above the ordinary value has generally been allowed, while in Scotland the price has been on the basis of 45 years' purchase, equal to a tax of 100 per cent. Mr. Leslie Scott's committee of the Ministry of Reconstruction, reporting recently on the acquisition and the valuation of land, recommended that such bases of valuation should be swept away, and that there should be no extra payment at all because land is acquired for public purposes. This proposal is likely to be adopted. On the other hand, it is hoped that the proposed light railways will utilise private land as little as possible. As far as may be they are to be laid on waste at the side of public roads, and where necessary on the roads themselves, so that the capital cost may be kept down. That there is great need to reduce the initial cost is plain from the fact that in this country hitherto light railways have cost, exclusive of equipment and rolling stock, well on for £6,000 per mile. In Belgium the figure was nearly £4,000, but this included rolling stock.

A useful suggestion is that the Agrail Board should be constituted as a limited liability company of the public utility society type, with directors appointed by the Board of Trade in consultation with the Board of Agriculture. Such a scheme would provide for one of the directors being a salaried expert light railway engineer.

A possible procedure may be outlined in this way. A local authority desiring to provide improved facilities would apply to the Agrail Board for a survey, a preliminary inquiry, and a rough estimate to be made. A *prima facie* case having been made out, the Agrail Board would prepare plans, estimates, etc., and would then ask the local authority to contribute 50 per cent. of the cost, the Development Commission supplying the rest. Then would come an application to the Light Railway Commissioners for an Order. The usual procedure would here be followed, and the Order when confirmed by the Board of Trade would provide for the compulsory acquisition of any land required. The Agrail Board would construct and equip the line, and lease it to an operating company, the capital of which would require to be only very small.

Such an arrangement would at all events closely follow that in Belgium where the capital is subscribed by the State, the provinces, and the communes, where the Local Railways Society has the general supervision, and where companies work the lines. The general return on the capital of the Belgian system is only 3 per cent. or less, and this is reached by averaging the lines which pay well with those which do not. Similarly, no one can expect a little gold mine in agricultural light railways. They are intended for the good of the country, and only a limited return on capital can be looked for.

In regard to the use of a 2 ft. gauge, railways of this size have been extensively used at the front during the war, so that much ready-made material exists, and more can be readily manufactured. Wagons and passenger carriages can be made with a considerable overhang, so as to give reasonable accommodation.

With respect to the motive power for agricultural light railways, they cannot, of course, at present get an electric supply wherever they go, and in such cases steam would probably be employed. On the other hand, if the proposed national electric supply scheme goes forward, electricity will become available in a large proportion of rural areas.

CONDITIONS OF AMERICAN TRAMWAYS.

On its physical side the average electric street railway in the United States is in the same condition as the average tramway in Great Britain, that is, it is very much run down. Commenting on the situation, the *Electric Railway Journal* of New York remarks that even before the United States went into the war prices generally were so high, and money, labour, and materials were so scarce, that comparatively little maintenance work had been done for a long time. The end of the war, however, will put new hope into the engineers, for they know that in due time they will be able to get the track, rolling stock, and power plant into "85 per cent. new condition," which valuation experts consider as excellent maintenance. "We do not delude ourselves," adds our contemporary, "into the belief that this is going to be done all at once; it will take years to get back into normal shape."

A Halifax Extension Wanted.—Halifax Corporation have informed Stainland Urban Council that they will extend the Halifax Tramways to Stainland as quickly as possible, but owing to the shortage of labour and the high cost of material a definite date cannot be given.

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EXTENSION OF NEW YORK SUBWAYS.

MUNICIPAL CO-OPERATION WITH RAILWAY COMPANIES.

By the recent completion of extensions and improvements the New York subway system can claim to be the world's greatest achievement in electric railway construction. It consists of 619 miles of track, serves four of the five boroughs of the city, and has a capacity of three billion passengers per annum. New York, after five years of construction work and the expenditure of 400,000,000 dollars, or more than the cost of the Panama Canal, has completed and has put into operation the greater part of the city's new system of rapid transit known as the dual system because of the Interborough Rapid Transit Company and the Brooklyn Rapid Transit Company having co-operated with the city in developing it.

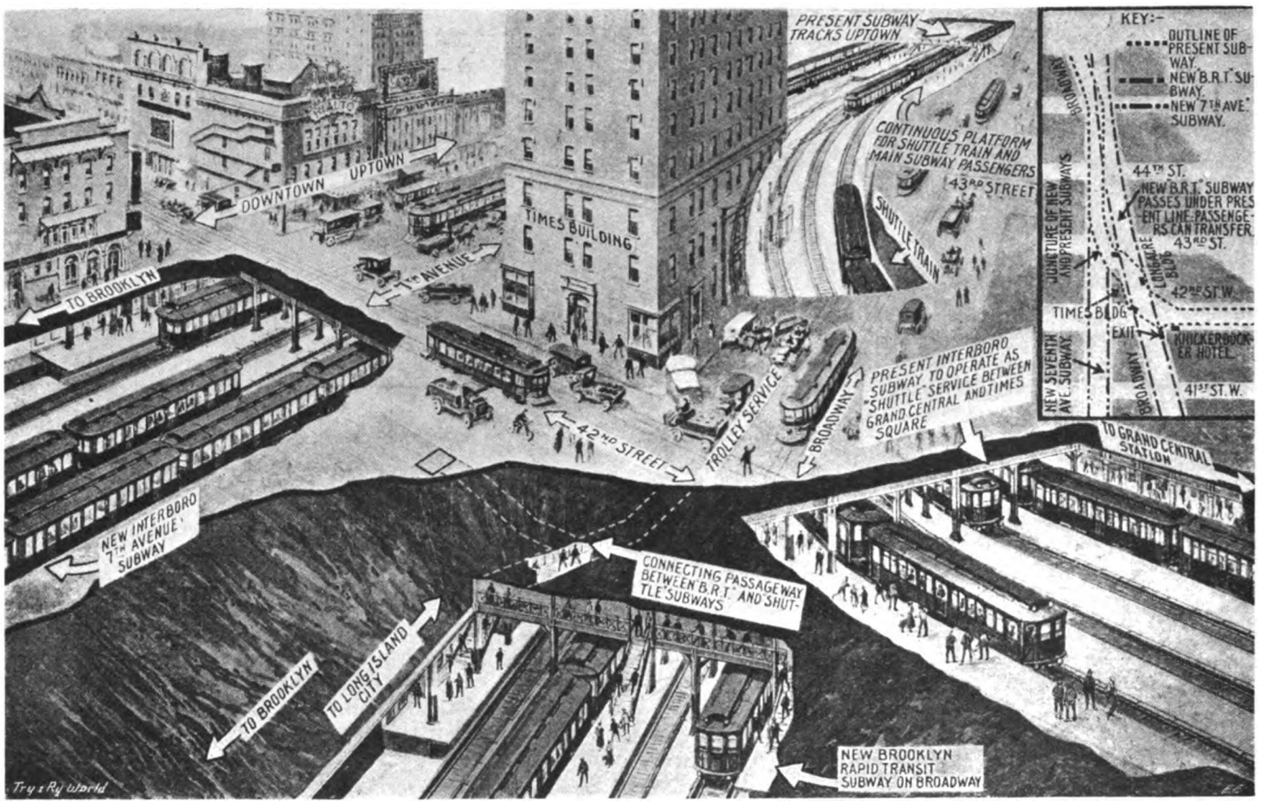
Four parallel elevated lines and a subway constituted the former rapid transit system in Manhattan. The subway started in Brooklyn, ran north through the eastern part of Manhattan as far as 42nd Street, west on 42nd Street to Broadway, and then north through the western part of the city, thus forming the so-called "Z."

In the new system the eastern part of the old subway has been continued south, thus forming two parallel and independent subways with a shuttle connection under 42nd Street. This arrangement is known as the "H." The eastern branch uses the old Brooklyn tunnel, while the western will later on enter Brooklyn through a new tunnel. These two subways are operated by the Interborough Rapid Transit Company.

A third subway is operated by the New York Municipal Railway Corporation formed by the Brooklyn Rapid Transit Company. This subway was built between two Interborough subways, which will eventually start in Brooklyn, pass under Broadway, Manhattan, and run over the Queensborough Bridge at 59th Street into Queens County. A fourth subway operated by the Interborough connects with the old subway at the Grand Central Station, and runs through the Steinway tube to Long Island City, thence into Queensborough.

Thus the railway mileage of New York City has been more than doubled and it has the most extensive subway system in the world, comprising more than two hundred miles of underground railway. Some of the subway routes have necessitated the boring of tubes under the East River at an enormous cost and difficulty.

To the elevated railways a third track has been added on which express service is provided during the rush hours, while instead of one subway there are now three with express service all day. Hence the transportation facilities have been increased five-fold in down-town Manhattan and three-fold elsewhere.



Subway Extensions in New York.

A large amount of new equipment was needed for the dual system. For this the Westinghouse Electric and Manufacturing Company furnished 600 control equipments for the New York Municipal Railways and 680 control equipments and 978 motors for the Interborough lines, the total cost of this apparatus being over 3,000,000 dollars. The power requirements are also greatly increased, and to supplement its present power equipment the Interborough Company has installed an 80,000 H.P. Westinghouse turbine generator.

The Ministry of Transport.—Progress is being made with the drafting of the Parliamentary Bill to constitute a Ministry of Transport. As already indicated, it is expected that the Minister of Ways and Communications will take over the railway powers of the Board of Trade and all the functions of the Light Railway Commissioners, the Road Board, the Road Transport Committee, and the Commissioner of Waterways. It is probable that an attempt will be made by the motor car interests to have a separate Road Ministry.

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THE COMMITTEE ON TRANSPORT.

EVIDENCE ON TRAMWAYS AND LIGHT RAILWAYS.

In our issue of December 19 last an abstract was published of the report of the Select Committee of the House of Commons on Transport. It will be recalled that owing to the shortness of the time before the dissolution of Parliament it was impossible for the Committee to conclude their inquiry, and they accordingly did not present final recommendations on most of the points submitted to them. The scope of their investigation was indeed very wide, because they were appointed to consider what steps it is desirable to take to develop and improve the internal facilities of transport within the United Kingdom, to secure effective supervision and co-ordination, and to ensure that such development is adequate and suitable to meet the national requirements. The minutes of evidence taken by the Committee have now been published in a Blue Book. The witnesses included railway managers, representatives of Government Departments, traders and others, and their testimony related to a wide variety of subjects connected with railways, canals, road motor transport, and to a limited extent tramways and light railways. We here give a summary of the evidence in regard to tramways, light railways, and the trackless trolley system.

TRAMWAYS AND LIGHT RAILWAYS.

Sir William Marwood, joint permanent secretary of the Board of Trade, gave evidence as to the powers and action of that Board in matters of transport. In reference to tramways, he said that the Board can authorise tramways by Provisional Orders, which have to be confirmed by Parliament. About Provisional Order procedure there is a weakness, or what a company promoting a tramway consider to be a weakness, namely, they have to get the consent of two-thirds of the local authorities on the route, or otherwise they cannot even get their case heard. One result of that is that such tramway Provisional Orders as the Board now have are mostly promoted by local authorities in their own districts, or in some cases going a little outside, in which case they are subject to obtaining the consent of the outside authority. The other method is to proceed by a Light Railway Order, and quite a fair number of tramways have been made under that. Tramway people are not so keen as they used to be, because the life of a tramway track is not what they formerly thought it was, and most of the profitable routes are taken up.

In regard to motor omnibuses, they are a cheaper method of developing a new route than a tramway until a considerable traffic is secured, when the advantage would probably rest with the tramway in moving that traffic. He believed it is entirely a question of the amount of traffic to be moved.

The powers of the Board of Trade are a little wider on the subject of construction of tramways than in the case of railways, because they can decide the position of the tramway in the road, the position on the pavement of a post for overhead equipment, and such matters of public convenience. In certain circumstances the Board can authorise the kind of vehicle to be used on tramways. In the case of light railways they can approve the form of vehicle. On the inspection of a tramway before opening, if they thought the rolling stock unsuitable, they would not allow the tramway to be opened. When, however, a tramway is once opened he did not think the Board have any power. A tramway company, however, cannot run trailer cars without the Board's consent. The Board considered that question more or less on the ground of safety. The Board also have statutory power of revision of fares, but it is a power they are hardly ever invited to exercise. The Board can increase fares, but as he read the Act it is only after a reduction. The Board have never really had that matter argued out. He thought the provision meant that if the Board have reduced the fares on a tramway on an application by the local authority or by the public, and circumstances have altered, they can then raise the fares again, but he did not think they had ever done it.

CARRIAGE OF GOODS.

In regard to the carriage of goods, the model form of Tramway Act contains a prohibition against carrying anything except passengers and parcels, but that is not its effect. It appears in the model form because he supposed they had to put in something. A great many Tramway Orders and Acts have contained a provision empowering the undertakers to carry goods, and a schedule of rates. The result of that is that some tramway authorities can carry goods practically on any portion of their system, whereas other authorities may only carry goods on portions of their system. If you take Bradford, for instance, roughly speaking on half their lines the Bradford Corporation may carry goods other than parcels, but on the other half they may not, which effectually prevents the carriage of goods on any part except on a very short piece. In other cases there is perhaps no power to carry goods at all. In certain cases, as in Manchester, for instance, they do a considerable business in carrying parcels. They had some slight difficulty over expending capital for the collection and delivery of parcels. In fact, at one time the cartage interests in Manchester got an injunction against them, but they got round that somehow. In Leeds they carry bricks on the tramways; there they have power to carry goods, and there is a brickyard inside Leeds, and a short extension line was authorised to connect up with that brickyard, and a certain amount of traffic of that sort is carried. Most tramway authorities carry their own materials. This matter has come before the House of Commons this session, because Sheffield, who, generally speaking, have no power to carry goods on their tramways, applied to Parliament to consolidate their special Acts, and the procedure was rather curious, because in that Consolidation Act they included a power to carry goods, which was an amending and not a consolidating power. The matter was contested in the House of Commons, and the House of Commons has allowed the provision, but it is going to be raised again in the House of Lords.*

It would seem only reasonable that when you have lines laid down you should carry goods, but there is the effect of competition on the railway undertaking to be considered, and also to some extent the residential question. In Bradford, where they have been very deeply into this question, they had an idea of putting sidings from the tramways into the various works, and pushing ordinary railway wagons along and putting them into those sidings. That may be all very well in a busy road, but those living in a quiet street which had a tramway up it might find it a nuisance if they were working all night long after the ordinary time of running the tramways.

At the moment the Board of Trade said, and he had talked to Mr. Whitley about it, who was quite in agreement, that if the Board found it necessary for the purpose of the war, that goods should be carried on any particular tramway they would, under the Defence of the Realm regulations, overrule any particular prohibition, but they have not had any case of that sort before them. In the coming peace time it is an important subject which has to be considered and dealt with. Part of the consideration will have to extend to whether the Board of Trade should be vested with some regulative powers, or whether there should be general legislation. It would have to be considered whether there should be a general removal of the disability or whether some authority, say the Board of Trade, should consider the particular cases. There may be reasons in some particular cases making it undesirable to give the power, at least on portions of a tramway, or it may be desirable to limit the hours during which the power may be exercised. Pushing railway wagons up and down all night long might almost become a nuisance.

TRACKLESS TROLLEYS.

In regard to the trackless trolley system, Leeds and Bradford were the first two places to put the system in operation, and as an engineering matter it is quite a success. There are, however, different views as to the effect of it on the roads. Some people say it is so admirably elastic that the road is equally used; other people say that the want of elasticity causes the wheels to run in grooves. Either side can produce photographs of a remarkable character of roads on which trackless trolleys have been running. It is a subject worth considering, because there is a great saving in the initial cost.

The Board have no power to authorise a trackless trolley installation. They endeavoured to take power in 1912, when they had a small Act before Parliament for amending the Light Railways Act, but there was a good deal of opposition, and the Board got beaten in Grand Committee on it. The County Councils Association got up the opposition because several big towns were promoting trackless trolleys in the country districts. He thought that generally speaking the system is used for extensions and not so much for connecting up the ends of tramway systems. The idea was to put up the overhead installation, and when the traffic has developed sufficiently to warrant the expense of a tramway, the rails are to be put down, and the overhead equipment wants very little alteration. There is, or might be, much less damage to a road if tramlines are put down, because they strengthen the road, whereas if you have these rather heavy vehicles, the loaded weight of which is about 5 tons, roving about on the surface of the road, damage is done. That is the objection of the outside authorities. They would not have minded tramways so much.

In reference to light railways, the Light Railways Act of 1896 which was for the encouragement of railway enterprise, set aside £1,000,000 which might be advanced to assist in these enterprises, three-quarters of which could be advanced by way of loan in cases where local authorities were contributing, and a quarter of a million could be allowed by way of advance either as a loan or as a free gift. The Board make recommendations to the Treasury, and the advance is paid as the work goes on. In 1912 the amounts that might be given in loans or special advance was altered. A quarter of a million might be given on loan, and three-quarters of a million as a special advance. The Board inspect the lines before certifying. In the way of special advances the Board have actually paid about £200,000, and the amount authorised is £348,000.

With respect to the trackless trolley system, it has only been working very recently, and he did not think there is any very conclusive evidence as to what the cost of running trackless trolleys

* The power to carry goods was afterwards refused by a House of Lords Committee.

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is. Brighton wanted to run double-deck trackless trolley cars, but the Board of Trade objected to it. He did not think any undertaking does run double-decked trackless cars, either here or abroad.

In regard to the use of trailer cars, the Board of Trade have to be satisfied as to the brake, and the trailer is subject to their approval, but the principal thing is to get a brake which will work more or less automatically between the two cars, and he thought there is a very satisfactory brake.

RAILWAYS AND SHORT-DISTANCE TRAFFIC.

Sir Francis H. Dent, general manager of the South Eastern and Chatham Railway, asked whether his company had considered the question of local traffic after the war, said that on the South Eastern and Chatham Railway, even before the war, short-distance traffic did not pay working expenses, and it did not contribute a penny towards the overhead charges. The difficulty which the South Eastern and Chatham Railway were in was that they, at very great expense in the early days of railways, constructed a means for bringing suburban people into London. It was not the right means; the right means for bringing people into London from short distances was by tramway. It took London a long time to realise the necessity for a system of electric tramways, and now that they have got that system, the paying part of the traffic goes to the tramways and the railway company are left with the unpaying part of the traffic—that is, the rush in the morning and the evening. The real way of carrying that traffic is by tramway, and the railway company are in the unfortunate position that they made that accommodation which is not now wanted. Electrification of the railway local traffic would increase the capacity, but it does not reduce the cost.

LONDON TRAFFIC.

Sir William Marwood, asked as to the principal recommendation of the Royal Commission on London Traffic, thought there should be a Traffic Board. The recommendation was not acted upon, as nobody could agree as to the constitution of a Traffic Board. The Board of Trade set up their traffic department mainly to keep going certain work that had been done by the Royal Commission on Traffic, such as keeping records, viewing the position, and making recommendations which local authorities might give effect to. The Traffic Branch came to an untimely end; the war came and led to its termination.

DEVELOPMENT OF INDUSTRIES.

THE CASE OF THE ELECTRICAL TRADES.

There was issued towards the end of January the report of the Engineering Trades (New Industries) Committee, which was appointed by the Ministry of Reconstruction in December, 1917. The instructions were to compile a list of the articles suitable for manufacture which were either not made in the United Kingdom before the war but were imported, or were made in the United Kingdom in small or insufficient quantities, and for which there is likely to be a considerable demand after the war. The Committee were also to make recommendations on the establishment and development of such industries by the transfer of labour and machines and otherwise, and as to how such a transfer could be made and what organisation would be requisite. The Committee set up 15 branch committees, each to give detailed consideration to groups of articles, and consisting of representatives of the trades concerned.

In their general observations the committee say that many engineering firms are threatened with serious financial trouble unless steps are promptly taken to finance payments due by engineering firms to the inland revenue in respect of munitions levy and excess profits tax. It is assumed confidently by the Committee that the excess profits tax will be removed as soon as possible; if it were not so removed there would be small likelihood of firms undertaking the risks inseparable from the starting of new industries. It is also the view of the Committee that the manufacture of many articles could not be successfully undertaken in this country by commercial enterprise alone, and it would therefore be necessary that some form of assistance should be given towards overcoming the difficulty of competition. It is clear to the Committee that in some branches of the engineering trades the industry has not kept pace with the up-to-date requirements of customers. The principal remedies for this state of affairs are specialisation and standardisation.

Another point to which the Committee draw attention is that manufacturing engineers were to some extent prevented from developing their businesses on proper lines by the personal fads and fancies of engineers in official positions, and by the practice among consulting engineers of insisting on individual designs. The result has tended to relegate our workshops to the manufacture of non-standard products. In Germany and the United States the more general practice has been for buyers to specify broadly what they wanted, and to leave the details to be worked out by the manufacturers, who thereby were allowed to develop on right lines and become more efficient, and the industry therefore was placed in a better position to do a world's trade.

In regard to labour conditions, the Committee recommend that a new industry should not be introduced into this country unless a wage should be paid to those employed in it which would ensure an adequate standard of living, and unless machinery is provided for regulating wages and hours of labour.

Among the branch committees whose reports are appended to the general report is the branch committee on electrical apparatus and machinery. This Committee considered a list of 60 articles, and were satisfied that the majority of them cannot correctly be described as not made in the United Kingdom or were made in small or insufficient quantities. The existing ample facilities were not, however, fully employed owing to the importation of articles from abroad.

Certain items, however, appeared rightly in the list, and as a result of the activities of the Committee, intimations have been received of intention to undertake the manufacture of the following articles:—Car lighting sets, car starting sets, electric truck and vehicle motors, fans, motors (small, ½ H.P. and less), small portable electric drills, small portable electric grinders, buffers, and polishers.

Certain articles appeared in a preliminary list which should be treated separately, these being carbons, insulating materials, magnetos, porcelain, glassware, and sparking plugs. As to carbons, measures should be taken by the Government to ensure the continuance of the industry. In regard to insulating materials, an enormous amount of research work is necessary, and manufacture in this country cannot be successfully established without State assistance and support. Many firms are preparing for increased production of insulating materials. The development of this industry is absolutely essential to the ultimate success and permanency of the British electrical manufacturing industry. The Committee recommend that electrical manufacturers should purchase only British-made insulating materials where obtainable.

Magnetos are now adequately made in this country, and the exclusion of German magnetos is recommended for a period after the war except under licence, together with a duty on all imported magnetos.

Co-operation has been established between porcelain manufacturers. Glass for arc lamps came exclusively from Germany and Austria. The method of manufacture of heat-resisting glass was practically unknown in the United Kingdom before the war. Since then some progress has been made, but it is represented to the Committee that unless Government support is forthcoming glass manufacturers will not be in a position to supply arc lamp glasses in sufficient quantities. The manufacture of sparking plugs should be encouraged.

The development of electric power will in all probability cause a demand for extra high tension switchgear for working pressures of 25,000 volts and upwards. The fact that such switchgear has not yet been manufactured on a commercial scale in the United Kingdom has led public authorities to place their orders for such gear abroad, usually in Germany or the United States, on the grounds that the work must be given to a concern which has "successfully done similar work before." British manufacturers of switchgear should be encouraged, because they have the capacity for such work.

The development of the electrical industry in Great Britain was hampered by stupid repressive legislation. Further, to prevent this country from developing the home industry, and obtaining its due share of overseas trade, foreign competitors deliberately tried to strangle the industry. The free importation into this country of manufactured goods has always formed a very serious hindrance to the development of the industry. Foreigners, operating in their own home markets, protected by tariffs and fostered nationally, produce on a far larger scale than the British manufacturer. In such conditions the industry cannot be expected to thrive. The Committee find that it is essential to establish confidence in the future of the industry by assuring it the support of the home market, without which it is hopeless to expect any great development. The Committee passed a resolution declaring that the electrical producers of this country are entitled to receive from the Government protection in the home markets against dumped and sweated goods.

In the event of the Government adopting the recommendations of the Electric Power Supply Committee's report (in favour of a national power supply), the present branch committee recommend the establishment of a permanent advisory council. This council should be mainly composed of leading British electrical engineers engaged in actual manufacturing. The council should be consulted in the first instance with regard to the gentlemen it is proposed to appoint as Electricity Commissioners, and should continue as a standing advisory council to the Electricity Commissioners, with a view to ensuring that national development and progress are in conformity with the latest workshop methods of quantity production.

The members of the branch committee on electrical machinery and apparatus are Messrs. John Taylor, O.B.E. (chairman); Herbert Taylor, (hon. sec.), Mather and Platt, Limited; L. D. Atkinson, Cable Makers' Association; A. F. Berry, British Electrical Transformer Company; R. Dumas, British Thomson-Houston Company; G. E. Pingree, British Thomson-Houston Company; D. N. Dunlop, British Electrical and Allied Trades Association; B. Longbottom, Electromotors, Limited; R. H. Schofield, Ferranti, Limited; S. D. White, General Electric Company; and F. Hird, Siemens Brothers and Company.

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THE ELECTRICAL INDUSTRIES AND THE POWER SUPPLY SCHEME.

The latest authoritative expression of competent opinion on the reports of Government Departmental Committees on the provision of a national electric power supply is contained in the following report sent to the President of the Board of Trade by a representative committee formed by the Institution of Electrical Engineers. The view is maintained that the functions of the proposed Board of Electricity Commissioners should be exclusively judicial and advisory, and that private enterprise should be given large scope.

(1) On June 27, 1918, the Council of the Institution of Electrical Engineers took into consideration the reports of the committees appointed by the Board of Trade on Electric Power Supply (Cd. 9,062) and Electrical Trades after the War (Cd. 9,072)

(2) These official reports embody recommendations leading to drastic revisions of the conditions under which the electrical supply industry had been carried on in Great Britain.

Recognising that the future course of development in electricity supply for industrial and domestic purposes, in electric traction, in electrical manufacturing, and in many other branches of electrical business, depended on the character of the legislation based upon these reports, the Council were convinced that the Institution of Electrical Engineers, as the body including and representing those engaged in all sections of the electrical industry, should endeavour to obtain and collate the opinions of these sections on the fundamental issues involved.

In view of the vital importance of a cheap and abundant supply of electricity to the engineering and other industries, the Council decided to form a special committee, and to include therein representatives of the most important consumers of electric power.

(3) Each of the following bodies was invited to nominate two representatives, who, with the president and four vice-presidents of the Institution of Electrical Engineers acting *ex-officio*, would constitute the committee :—

The British Electrical and Allied Manufacturers' Association, The Association of Consulting Engineers, The Federation of British Industries. The Cable Makers' Association, The Incorporated Association of Electric Power Companies, The Provincial Electric Supply Committee of the United Kingdom, The Tramways and Light Railways Association, The British Electrical Federation, Limited, Edmundsons' Electricity Corporation, Limited, The Iron and Steel Institute, The Conference of Directors of the London Electric Supply Companies, The Electrical Contractors' Association, The Incorporated Municipal Electrical Association, The Association of Municipal Corporations.

(4) At a preliminary meeting of the committee held on July 29, 1918, it was agreed that each association represented should give separate and independent consideration to the reports of the two Board of Trade Committees, and should draw up their recommendations as to the main lines which future legislation should follow. The Incorporated Municipal Electrical Association and the Association of Municipal Corporations had, however, decided to submit separate reports to the Board of Trade, and were not represented on the committee.

(5) The reports of the remaining associations were duly prepared and laid before the committee, after having been adopted in most cases by the respective Councils of the associations. They accordingly embody the considered opinions of the accredited representatives of several large groups of electric supply undertakings, the great majority of electrical manufacturers, consulting engineers, and the most important users of electric power for industrial purposes in Great Britain.

(6) Some of the reports were less detailed than others, and it is therefore not possible to present a combined opinion upon all the matters dealt with by the two committees of the Board of Trade. On no point of primary importance, however, is any material difference of opinion displayed. Substantially on the main issues relating to present electrical legislation the various associations showed an impressive unanimity.

(7) The following views and recommendations in regard to electric power supply more particularly are therefore presented as expressing the united convictions of the committee, and through them of the many sections of industry which they represent :—

(*a*) The restrictive conditions embodied in the Electric Lighting Acts, the Tramways Act, the Light Railways Act, and the various Acts relating to electric power supply have had a most detrimental effect on electrical progress in Great Britain. This legislation has led to the multiplication of small, arbitrary, and uneconomical areas of electricity supply and systems of electric traction ; it has discouraged the investment of capital in electrical undertakings by imposing limited tenure with unattractive terms of expropriation and various other onerous conditions ; it has placed obstacles in the way of grouping undertakings into comprehensive systems of supply and transport ; it has, generally, prevented British electrical engineers and manufacturers from realising in their own country the highest achievements of which their technical skill and productive capacity were capable, and it has in consequence put them under a serious handicap in the competition for export business against countries in which the conditions have been more favourable for successful commercial demonstration.

(*b*) The evil effect of past legislation, emphasised so strongly by both the official reports, necessitates drastic reform of the enactments referred to, both in the spirit and the letter, if the industry is to fulfil its function of providing cheap and abundant electricity for industrial, agricultural, and domestic purposes, and for the development of electric traction on railways, light railways, and roads.

(*c*) In addition to releasing electrical enterprises from the existing disabilities, the chief necessities of the situation are (1) the treatment of the problem of electrical generation and distribution on broad lines, and (2) the provision of simple forms of procedure in obtaining powers for electrical utilities.

(*d*) In order to secure these and other essentials of ordered progress, the appointment of a Board of Electricity Commissioners is welcomed subject to the provisions expressed below.

(*e*) The Committee are strongly convinced that, owing to the complexity of the technical, administrative, and financial problems involved in a comprehensive scheme of electric supply reform, it will be found altogether impracticable to deal directly with the task of reconstruction by means of general legislation covering all the points at issue. They accordingly urge that immediate action should be confined to the creation of the Board of Electricity Commissioners, who should have powers and functions as outlined in the following paragraphs. There should be a gradual development in the establishing of the administrative machinery as the necessity is felt, otherwise the industry may be hampered in the future by excessive organisation, to the same extent as it has been in the past by the conditions referred to.

(*f*) This board should be a tribunal of skilled men, free from political influence, charged generally with the duties of (1) examining all proposals for the extension and consolidation of existing electrical enterprises ; (2) recommending to the Board of Trade and to Parliament, for authorisation, schemes which are on the soundest financial and engineering lines, and (3) advising the Government on legislative matters for the encouragement of the electrical industry.

(*g*) The functions of the board should be exclusively judicial and advisory. Strenuous objection is urged against the granting to the board of administrative powers over electrical undertakings, and also of authority to appoint District Boards in the event of such bodies being constituted. In this respect the powers of the Commissioners should be limited to examining schemes brought before them for dealing with the various districts.

(*h*) The preparation of such schemes, whether company, municipal, or joint, should be left as a matter of free and natural development to the initiative of undertakers who would formulate such schemes (it may be rival schemes) and put them forward for the consideration of the Commissioners, who would report to Parliament upon any Bills intended to carry them into effect. Opponents would be entitled to be heard against such Bills in the usual way.

(*i*) The board may be empowered to deal with the electrical rules and regulations administered by the Board of Trade and the Home Office, and it may also act as arbitrator and as a Court of Record for the electrical industry.

(*j*) The Railway and Canal Commission is suggested as a general model for the constitution and powers of the board.

(*k*) The number of Commissioners on the board should be five, and in all cases the appointments should be permanent, or for long periods, and should be on such conditions as will attract men of the highest ability, knowledge, and independence. One member should be skilled in legal affairs and in sifting evidence, one in finance, one in the problems of electrical manufacture, and the others with experience in engineering and the management of electrical undertakings.

(*l*) While in the main the work of the board will consist of formulating the principles of procedure in the course of electrical progress, and of recommending the legislative amendments and the specific schemes which are in agreement with these principles, it may be necessary in some cases for the board to propose the enforcement, by Parliamentary authority, of arrangements for interconnection or amalgamation of supply undertakings.

(8) Recommendations have been made by various associations represented on the Committee regarding specific matters dealt with in the reports of the two Board of Trade Committees, but it is felt that these problems will receive a satisfactory solution as a result of the formation of an independent authoritative Board of Electricity Commissioners, which is the crucial matter at this stage

I am directed respectfully to urge on behalf of the committee that legislation adverse to the views of the large proportion of the industry and of the consumers which the committee represents may not be introduced without their being accorded an opportunity of discussing the matter with you.

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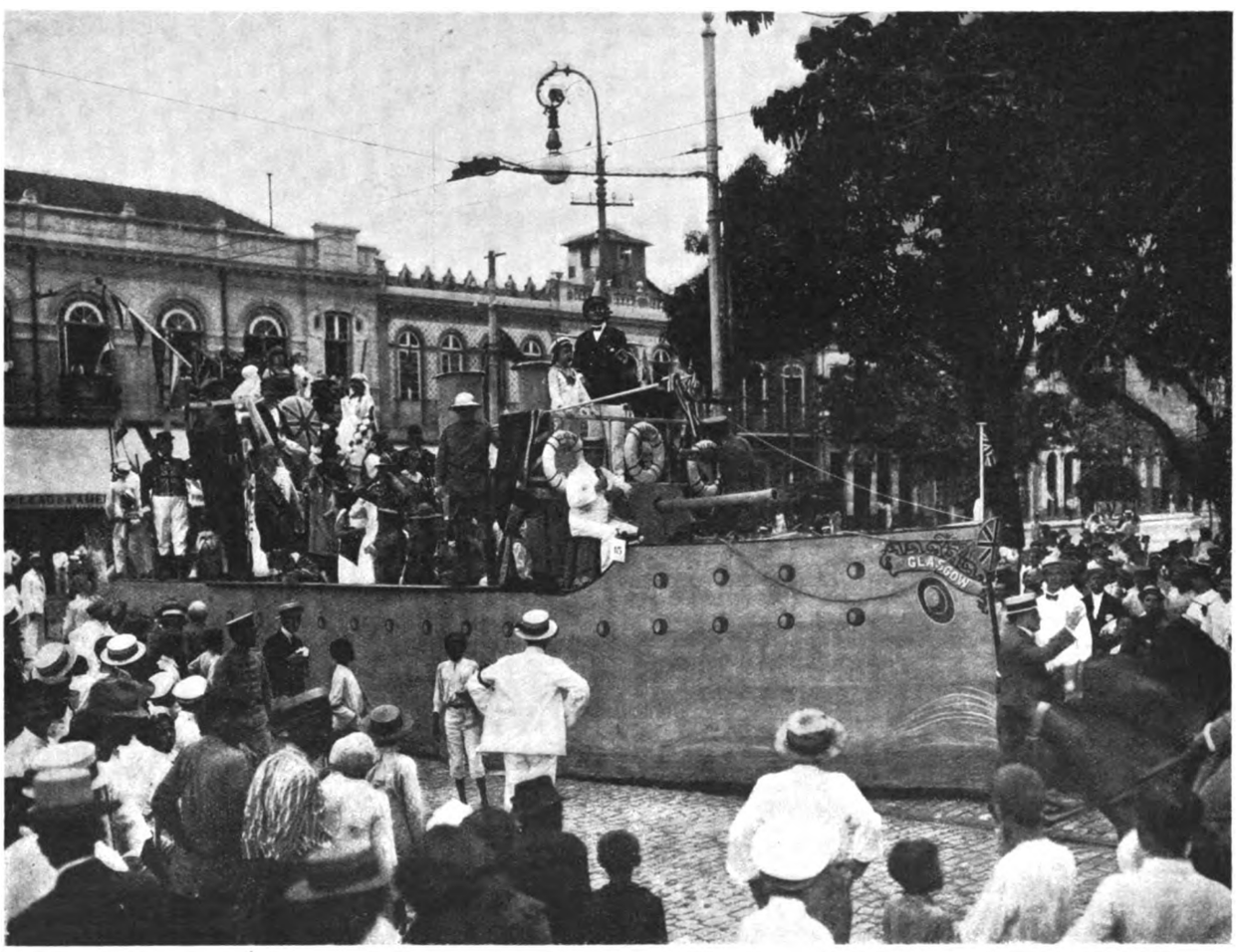
AN "ARMISTICE" CAR ON PARA TRAMWAYS.

We are indebted to Mr. Walter Binns, manager of the Para Electric Railways and Lighting Company, Limited, for the photograph which is reproduced on this page of the company's car in the procession which took place in Para on December 1, the day appointed for the celebration of the armistice. The procession was an imposing one, the cars being excellent reproductions representing the various allied countries, the greatest impression being created by "our car," representing England, which consisted of a model of H.M.S. *Glasgow*, the favourite warship on the South American station, renowned for the part she played in the Coronel and Falkland battles.

The model was constructed on one of the company's freight cars, and was manned by a crew of some forty persons, including a number of Englishmen and several Brazilian maidens dressed in costumes representing the different colonies of the Empire, with Britannia sitting aloft holding trident and shield. It was only becoming that the cruiser should have some worthy representatives of Scotland on board, and at the bow, in charge of the forward turret, was Mr. Burnet, of Lenzie, formerly in the service of the Glasgow Corporation, and now with the Para Electric Railways Company, and on the after deck, Mr. Thomson, of Glasgow, is seen standing as John Bull with his dog. Amidships, Mr. Kay, of Dundee, represented Tommy Atkins. Mr. Binns, in white, is seen standing just by the stern.



The car created a great impression, being generally voted as the finest representation in the procession. At frequent intervals during the march of the procession through the city, salvos were fired from a small cannon in the bow, controlled by Mr. Burnet, and at night-time the cruiser was outlined with electric lamps, making a truly unique spectacle.

In Brazil, as no doubt in many other countries, the part which this country has played during the war is very imperfectly understood, and Britishers in Para took the opportunity to impress upon the people the all-important part played by the British navy in the war.

Mr. John Wiseman, secretary to the Edinburgh and District Tramways Company, died suddenly on February 6 from pneumonia.

MANUFACTURE OF MUNITIONS.

Work of the London County Council Tramways Department.

The London County Council, on December 17, passed a resolution of thanks to members of the staff in the tramways department engaged during the war on work in connection with the manufacture of munitions.

A report of the Highways Committee gave some particulars of the work done during the past three and a half years in the tramways department in the manufacture of munitions. In June, 1915, the Council placed its resources at the service of the Ministry of Munitions and the Metropolitan Munitions Committee, but certain assistance had been given by the tramways department since the early part of 1915. The services rendered consisted of the loan of technical officers and the manufacture and examination of munitions, etc.

The work performed was of a very varied character, but the efforts of the department were mainly concentrated on the manufacture of gauges of all sizes for field guns, howitzers, naval guns, tanks, munitions, etc. About 18,300 gauges were delivered and passed, and in addition 506 gauges in course of manufacture on the conclusion of the armistice have been taken over by the Government. Steps had also been taken to render assistance in the manufacture of screw gauges, but the work was suspended on the cessation of hostilities. Other classes of work executed included the manufacture of 7,725 high explosive shells, the banding of 36,039 shells, the manufacture of 214 height measuring apparatus for aircraft work, 30,300 steel rings for adapters, shell forging callipers, rumbling drum machines, trucks for carrying fulminate, light trolleys, and test pieces. The whole of the necessary alterations to existing plant and the new boring bars and other tools necessary to undertake the manufacture of shells was entirely carried out by the department.

From time to time expressions of appreciation have been received both orally and in writing, with regard to the assistance rendered to the Government by the prompt and efficient manner in which urgent and intricate work has been carried out, concluding with a letter from the director of munition gauges, expressing the appreciation of his department for the perseverance shown in surmounting the great difficulties which had to be overcome in connection with the work.

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THE ENGLISH ELECTRIC COMPANY.

EXPANSION OF DICK, KERR AND COMPANY.

Much interest is being taken in electrical manufacturing and traction circles in the fact that the arrangements foreshadowed by the chairman at the annual meeting of Dick, Kerr and Company, Limited, on December 19 last, are now being carried out. We have referred briefly to the scheme in former issues, and we understand that the plan for the fusion of interests is proceeding satisfactorily. The particulars of the scheme were set out in circulars issued to the shareholders. The new company which is being formed is entitled the English Electric Company, Limited. This company, whose offices are at Abchurch Yard, Cannon Street, London, E.C., has acquired a controlling interest in the Coventry Ordnance Works, Limited, and the Phœnix Dynamo Manufacturing Company, Limited. An offer is made to the shareholders in Dick, Kerr and Company to exchange their shares, ordinary or preference, for an equal number of similar shares in the English Electric Company. The shareholders accepting the offer have been given the right to subscribe at par for one ordinary share of £1 in the new company for every three shares, ordinary or preference, exchanged. The English Electric Company has a nominal capital of £5,000,000 (£1,500,000 preference and £3,500,000 ordinary), and as the transfer of shares in Dick, Kerr and Company would absorb only £2,000,000 of this capital, it is evident that the directors have important developments in view.

The first directors are:—

C. T. Cayley, 5, Portland Place, W. (chairman of Dick, Kerr and Company).
B. A. Firth, Norfolk Works, Sheffield (chairman of Thomas Firth and Sons).
W. Rutherford, 3, Abchurch Yard, E.C. (managing director Dick, Kerr and Company).
J. Sampson, 8, The Sanctuary, Westminster, S.W. (director of John Brown and Company).
P. J. Pybus, Thornbury, Bradford (managing director of Phœnix Dynamo Company).
Colonel J. H. Mansell, The Chace, near Coventry (managing director, Coventry Ordnance Works).
A. Gracie, Fairfield Works, Glasgow, engineer.
W. L. Hichens, 3, Central Buildings, Westminster, S.W. (chairman of Cammell Laird and Company).
C. E. Ellis, Rampton Manor, Notts, manufacturer.

The board is thus a particularly strong one, and representative of the leading engineering industries. Three large railway companies are represented by Sir Charles Ellis for the Great Eastern Railway, Mr. W. L. Hitchens for the London and North Western Railway, and Mr. B. A. Firth, for the Great Northern Railway, while Mr. John Sampson, a director of Messrs. Harland and Wolff, Limited, and Sir Alexander Gracie, of the Fairfield Shipping and Engineering Company, represent shipbuilding and owning interests The joint managing directors are Lieut.-Col. J. H. Mansell, Messrs. P. J. Pybus and W. Rutherford.

RESIGNATIONS FROM ROAD BOARD.

Sir George Gibb has resigned the salaried post of chairman of the Road Board, which he has held since its formation in 1910. He is, it is added, accepting the position of consulting general manager of the North Eastern Railway, of which he was solicitor for many years and general manager from 1891 until 1906.

Mr. Rees Jeffreys has resigned the secretaryship of the Road Board to accept the position of financial adviser to the Motor Union Insurance Company, Limited, of which he was one of the founders and original directors. He has also been elected chairman of the Federated British Insurance Company, Limited.

Mr. Rees Jeffreys, as reported in another column, is now acting as chairman of a representative committee who are drafting a Bill for a Traffic and Development Board for London and the Home Counties. At the request of the Demobilisation Committee he prepared the road programme for 1919-1920.

Stephen Sellon and Partners.—We are informed that Mr. Stephen Sellon's practice will be continued by Messrs. Arthur R. Hoare and S. Rutter Fletcher, both of whom have been associated with Mr. Sellon for the past twenty years, with the same firm name and at the same address (36, Victoria Street, London, S.W.1).

Mr. C. H. Wordingham, C.B.E., who since 1903 has been head of the electrical department of the Admiralty, and as such responsible for the design and supervision of the construction and completion for service of the electrical equipment of all H.M. ships, as well as for advising on all important questions of electric lighting and power in connection with dockyards and other naval shore establishments, has resigned his appointment as director of electrical engineering in order to return to consulting practice. His address is now 7, Victoria Street, Westminster, S.W.1. Mr. Wordingham has been retained by the Admiralty to continue acting in an advisory capacity.

CONTRACTS AND ORDERS.

The Rail Welding Company, of London, have received an order for the repair of 250 tramway rail joints from the Heywood Electricity and Tramways Committee.

Bradford Tramways Committee have accepted tenders from Hadfields, Limited, for cast and steel crossings, and for copper bonds from the Britannia Lamp and Accessories Company.

New Shelters at Dudley.—The Corporation have accepted the tender of Bayliss, Jones and Bayliss, Limited, for ironwork, and of Messrs. Round and Son, for woodwork required for the erection of four tramway shelters.

Dick, Kerr and Company, Limited, recently secured a contract for the supply of a 3,000 KW. 3,000 revolutions per minute turbo-alternator set, together with condensing plant, to Cammell Laird and Company, Limited. The turbine will be of the Willans-Zoelly type, to operate on steam at 160 lb. pressure, superheated to 650 deg. Fahr., and the condensing plant of the surface type, with the Willans rotary system of air extraction, the circulating ejector and extraction pumps being driven by an auxiliary turbine which will exhaust into a feed-heater. The turbo-alternator, by Messrs. Siemens Brothers and Company will supply three-phase current at 3,300 volts, 50 cycles, and will be fitted with an overhung exciter.

FINANCIAL REPORTS AND MEETINGS.

CROMPTON AND COMPANY, LIMITED.—An interim dividend at the rate of 7 per cent. per annum for the six months ended September 30 last has been declared.

BLACKPOOL, ST. ANNE'S AND LYTHAM TRAMWAYS COMPANY.—During the past year this undertaking carried over eight million passengers. The receipts were £63,620, and the available balance was £10,347. Debenture interest requires £7,500 and £1,500 is carried to the sinking fund. There is an adverse balance of £39,084.

PROVINCIAL TRAMWAYS COMPANY.—Presiding at the annual meeting of the Provincial Tramways Company, the chairman, Mr. A. Beattie, said that the past year was the best in the history of the company. They had been working under great difficulties and the cost of materials had increased considerably, while wages had also risen, but very satisfactory results had been obtained without an increase of fares.

LIVERPOOL OVERHEAD RAILWAY COMPANY.—A final dividend for the half year ended December 31 last has been declared at the rate of 5 per cent. per annum, less income tax, on the preference shares, and 4 per cent. per annum on the ordinary shares, making the rate for the year 5 per cent. on the preference shares and 3½ per cent. on the ordinary shares.

SOUTHPORT TRAMWAYS.—The results for the 12 months ended March 31, 1918, show that the traffic revenue, which amounted to £23,875, was a record for the undertaking. The gross profit of £10,263 is also a record. Owing to the payment out of net revenue of expenses incurred in the purchase of the Southport Tramway Company's undertaking and of war allowances amounting to £334 there is, however, a net loss of £103.

YORKSHIRE (WEST RIDING) ELECTRIC TRAMWAYS COMPANY, LIMITED.—For the year ended December 31, 1918, the traffic and other revenue aggregated £140,568. After providing for debenture interest and making provision for deferred repairs, there is a net income of £15,303. Adding the amount brought forward from last year, viz., £20,609, the available balance is £35,912. This sum has been appropriated as follows:—Dividend at 6 per cent., less income tax, on cumulative preference shares, £9,888; purchase of funded preferential dividend certificates, £11,187; renewals, depreciation and reserve fund, £12,311; balance carried forward, £2,526.

AYR CORPORATION TRAMWAYS.—The report of the general manager Mr. William Grant, for the year ended May 15, 1918, states that the total receipts amounted to £24,562 and the working expenses to £14,416, leaving a gross profit of £10,146. After payment of interest and sinking fund charges, and making allocation to the depreciation and renewals fund of £2,547, the sum of £2,118 was transferred to the general borough assessment. The revenue was the highest ever received. The traffic receipts were £23,318, an increase of £3,562. The receipts per car-mile were 13·37d., as against 11.79d. Passengers increased by 12·81 per cent. The energy consumption was 1·14, or an increase of ·06 units per car-mile, which is attributed largely to the indifferent driving by some of the women. The working expenses, including power costs, were 8·26d. per car-mile, and the percentage of working expenses to receipts 58 per cent. In view of the continued increases in working expenses, halfpenny fares were abolished and fare stages readjusted in April last.

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UNDERGROUND ELECTRIC RAILWAYS.—The directors of the Underground Electric Railways Company of London state that, subject to confirmation of the dividend announcements by the companies in which the company is interested, the revenue of the company will enable it to pay the interest to December 31 last on its 6 per cent. first cumulative income debenture stock, and to pay the full interest of 3 per cent., free of income-tax, on its 6 per cent. income bonds of 1948 for the half-year ended December 31, with a carry forward of £36,700. A year ago the payment on the 6 per cent. first income debentures was at the same rate, but that on the 1948 income bonds was 4 per cent. for the year.

DUBLIN UNITED TRAMWAYS COMPANY.—The report for the year ended December 31, 1918, is summarised below in comparison with the three preceding years. The amount available for division at December 31 last was £117,493. Interim dividends amounting to £22,620 were paid in August last, leaving a balance of £94,873. The directors recommend a dividend of 6 per cent. per annum, less income-tax, on the preference shares for the half-year, and a final dividend at the rate of 6 per cent. per annum, less income-tax (making 5 per cent. for the year) for the half-year, together with a bonus of one shilling, free of income-tax, per £10 unit of ordinary stock, setting aside £35,000 towards deferred renewal of rails and cars, and adding £15,000 to the general reserve fund. These appropriations, together with £1,850 to be written off the price of investments, bringing them to their present market value, absorb £104,230, leaving £13,263 to be carried to the next account.

	1918.	1917.	1916.	1915.
	£	£	£	£
RECEIPTS—				
Traffic receipts	443,401	353,838	319,612	317,762
Parcels delivery	7,725	7,313	6,987	7,467
Advertisements	3,742	3,697	3,980	4,143
Carriage of goods	3,635	2,361	2,094	1,874
Other receipts	2,653	2,727	2,662	2,653
Total receipts	461,156	369,936	335,335	333,899
EXPENSES—				
Working and general	310,946	243,152	213,587	201,836
National insurance	877	900	915	961
Repairs to cottages	1,454	1,387	1,191	1,235
Parcel delivery	6,364	5,146	4,143	4,400
Goods carriage	2,293	1,366	1,025	951
Total expenses ...	321,934	251,951	220,861	209,383
Balance on working	139,222	117,985	114,474	124,516
Balance from last account ...	13,461	13,359	13,045	11,366
Interest	2,842	1,636	1,650	1,902
Total balance	155,525	132,980	129,169	137,784
DEDUCTIONS—				
Interest on debentures	20,490	21,496	22,868	25,421
Wayleaves	11,247	11,798	12,107	13,518
Payment to Howth Co. ...	3,000	3,000	3,000	3,000
Renewals, etc.	3,295	450	—	—
	38,032	36,744	37,975	41,939
Balance available for division ...	117,493	96,236	91,194	95,845
Div. on Pref. shares, 6 per cent. for year	25,650	27,000	27,900	31,200
Interim div. on Ord. shares for half-year	9,570 (4% p. ann.)	9,900 (4% p. ann.)	10,560 (4% p. ann.)	14,781 (5% p. ann.)
Final div. on Ord. shares ...	13,860 (6% p. ann.)	12,375 (5% p. ann.)	12,375 (5% p. ann.)	13,819 (5% p. ann.)
Bonus on Ord. shares	3,300	—	—	—
Reserve for renewals of permanent way	35,000	15,000	20,000	18,000
Reserve and renewals fund ...	15,000	7,000	7,000	5,000
Balance to next account ...	13,263	13,461	13,359	13,045
Written off investments ...	1,850	11,500	—	—
	117,493	96,236	91,194	95,845
Car mileage	6,787,654	7,732,897	7,440,614	7,881,938
Energy consumption	12 303,241	14,062,350	13,007 405	13,277,831

BRADFORD CORPORATION TRAMWAYS.—The report for the year ended March 31, states that the increase of traffic has been very great. The traffic revenue (excluding railless system) amounted to £366,495, as against £326,406 in the previous year, an increase of £40,089. Notwithstanding a decrease in car mileage of 194,124 or 3·38 per cent., the revenue has increased 12·28 per cent., which has had the effect of raising the receipts per car mile from 13·674d. to 15·892d. The expenditure has increased £45,253. Allowances to dependants of employees total £22,231, an increase of £7,880. There have been increases in traffic expenses owing to increases in wages and bonuses and the high cost of material. The cost of labour has risen to 61·75 per cent. of the total expenditure and 48·3 per cent. of the total income. The necessity of building up a reserve fund to meet the position after the war is emphasised. The total revenue (excluding bank interest, rents, etc.) amounted to £402,181, as compared with £356,025. Car mileage (excluding railless) was 5,534,858, as against 5,728,982; but notwithstanding this, there was a large increase in the number of passengers carried, the figures being 84,129,252 as against 77,074,546. The average number of journeys per head of population served was 227 as compared with 208. In connection with the through running between Bradford and Leeds, 662,570 through passengers had been carried in both sets of cars during the year. The income of the parcel traffic department shows a substantial advance, being £13,023, as compared with £11,729.

	1918	1917	1916	1915
	£	£	£	£
Income—				
Traffic revenue	366,495	326,406	314,486	305,005
Traffic, railless system	12,249	10,705	8,780	4,316
Sundry receipts	23,437	18,914	18,358	20,567
Total Income	402,181	356,025	341,624	329,888
Expenditure—				
Traffic expenses	122,129	105,109	92,158	89,470
General expenses	41,631	39,456	37,408	34,106
Repairs and maintenance ...	68,723	50,277	58,475	61,606
Power expenses	54,448	53,737	54,156	52,938
Miscellaneous expenses	5,836	4,529	4,416	5,191
	*292,767	253,108	246,613	243,311
War allowances	22,231	14,352	8,338	2,784
	314,998	267,460	254,951	246,095
Balance carried to net revenue ...	87,183	88,565	86,673	83,793
Interest, etc.	2,266	1,167	1,400	2,812
	89,449	89,732	88,073	86,605
Deductions—				
Interest	21,553	20,256	21,174	22,087
Income tax	10,193	10,693	7,987	5,422
Rents, leased lines	3,502	3,693	4,033	4,203
Net profit	54,201	55,090	54,879	54,893
Appropriated as follows:—				
Repayment of loans	—	—	1,003	1,003
Sinking fund	22,825	24,289	24,106	21,448
Relief of rates	10,000	3,400	25,000	10,000
Maintenance, etc.	116	1,924	233	7,832
Reserve fund	21,260	25,477	4,537	14,610
	54,201	55,090	54,879	54,893
Mileage of track	108¾	108¾	108¾	108¾
Car mileage	5,905,356	6,086,770	6,199,582	6,194,057
Units per car mile	2·101	2·018	1·990	1·900
Traffic receipts per car mile ...	15·892d.	13·674d.	12·842d.	11·816d.
Power cost per car mile	2·297d.	2·200d.	2·165d.	2·027d.
Traffic revenue per mile of single track	£3,484	£3,002	£2,892	£2,807
Expenses per car mile	12·322d.	10·063d.	9·450d.	8·774d.
Passengers carried	84,129,252	77,074,546	74,082,612	70,077,271
Fare per passenger	1·079d.	1·049d.	1·047d.	1·059d.
Ratio of expenses	78·32%	75·12%	74·63%	74·60%
Number of cars	233	234	236	252

* A loss of £513 on the Railless system is included in the working expenses.

COVENTRY TRAMWAY EXTENSIONS.

SCHEME FOR MOTOR OMNIBUSES LATER.

The City Council have adopted important recommendations of the Tramways Committee, which are based on a long and interesting report prepared by the general manager, Mr. T. R. Whitehead. Application is to be made to the Board of Trade for consent to important extensions and to borrow £333,616. This amount is the estimated cost of the work at pre-war rates, plus 75 per cent. The plans include the reconstruction and part doubling of certain lines, the reconstruction and extension of several other lines, twenty new cars, new car sheds, alterations to certain buildings, and the provision of a motor wagon.

Mr. H. W. Wale, chairman of the Tramways Committee, in submitting the report, said that the committee had in view not only the present needs but prospective requirements, and before coming to a decision they had looked closely into the question of what was the most suitable form of traction to employ in Coventry, and having regard to the peculiar traffic requirements, he was strongly of opinion that a motor omnibus service could not carry the traffic. He dwelt on the greater carrying capacity of tramway cars as compared with motor omnibuses. If the latter were used, 40 per cent. more vehicles would be required. At one point in the city at a particular hour seventy cars passed, and it was estimated that to deal with the same traffic, ninety-two omnibuses would be required. Examining the cost of tramways versus omnibuses, the chairman said the comparison was unfavourable to the petrol-driven vehicle, and in coming to a decision with regard to a motor omnibus service on present routes, the committee were of opinion that the tramway car was the best system of transport, although omnibuses would be a valuable adjunct. Later they would probably submit a scheme for the use of omnibuses as feeders.

Proposed Maidstone Extension.—Maidstone Town Council have passed a resolution to engage Mr. C. C. Hawtayne as consulting engineer in place of the late Mr. Stephen Sellon, and to instruct him to report on proposed extensions of the light railways in North and King Street Wards and to Chatham. It was mentioned that it would not be possible to begin the work of construction for two years, and that by that time the cost would probably be less than if such construction were carried out now.

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PERSONAL.

Mr. R. O. Baldwin, general manager of Exeter Corporation tramways, has been granted an increase of £50 in salary.

Mr. C. O. Silvers, general manager of Wolverhampton Corporation Tramways, has been granted an increase in salary to £600 per annum.

Mr. D. H. Davies, borough electrical engineer and tramways manager of Heywood, has been granted an increase in salary of £50 per annum.

Sergeant-Major W. Duddington, South Shields Corporation Tramways, has been awarded the D.C.M., and has been twice mentioned in despatches.

Mr. W. A. Toppin, assistant electrical engineer of Chesterfield Corporation, succeeds Mr. Acland in charge of the electricity and tramways departments.

Mr. Charles W. Hill has been demobilised from the Navy and has resumed his position of director of Messrs. Scholey and Company, Limited, of 56, Victoria Street, Westminster, S.W.

Lieut.-Col. Morrison Bell has been appointed to represent the London County Council at the annual conference of the Municipal Tramways Association, in the place of Mr. A. H. Scott.

Mr. A. Toms, London sales manager of the J. G. Brill Company, has been released from Government service and has now resumed duties at the London office of the company, 110, Cannon Street, E.C.4.

We regret to learn that **Mr. J. M. McElroy,** general manager of the Manchester Corporation Tramways, who has for some time been in ill-health, will not be able to resume his duties for several months.

Mr. W. MacGibbon, who has recently been appointed manager of the Mexborough and Swinton Tramways, will retain also the management of the Dewsbury and Ossett Corporation and Soothill Nether Urban District Council Tramways.

Mr. H. C. Babb, resident engineer for the past three years at Bo'ness electricity works, has been appointed general manager of the Musselburgh and District Tramways and Lighting Company. Mr. Babb entered upon his duties on February 1.

Sir Guy Granet, late general manager of the Midland Railway, advised the Government to undertake the construction of the Channel ferries at Sandwich and Southampton while he was acting as director in charge of movements at the War Office.

Mr. A. L. C. Fell, general manager of the London County Council Tramways, has been appointed by the Home Secretary to be an additional member of the committee which is considering the licensing of partially disabled men as drivers of public motor vehicles.

Mr. J. H. Rider has been retained to advise the combination of Nottingham, Derby, Leicester, Mansfield and other Midland towns on the question of electric power supply. Mr. Rider is taking the place of Sir John Snell, who has accepted a Government appointment.

Mr. C. J. Spencer, general manager of the Metropolitan Electric Tramways and the London United Tramways, has also been appointed general manager of the South Metropolitan Electric Tramways and Lighting Company. **Mr. A. V. Mason** has been appointed engineer to the three companies.

Mr. George Webster, manager of Rochdale Corporation Tramways, has received the Order of the British Empire as a recognition of work done in connection with the war. Mr. Webster for two years acted as honorary secretary of the Rochdale Shell Factory, which carried on work at the tramway sheds in Mellor Street. He was afterwards elected a member of the board of directors.

Mr. Harry Haward, Controller of the London County Council, who has been serving, at the request of the Army Council, on the Committee appointed to inquire into the staff of the War Office, is also serving on a committee appointed by the Chancellor of the Exchequer to consider the recommendations contained in the seventh report of the Select Committee on National Expenditure.

Mr. H. Vernon has been appointed rolling stock and overhead equipment engineer of Belfast Corporation Tramways, in succession to Mr. A. A. Blackburn, who took over the managership of the Huddersfield system on January 1. Mr. Vernon has been superintendent of the tramways engineering works since the electrification of the system 14 years ago. The appointment is subject to confirmation by the Council at its next meeting.

Brigadier-General H. P. Maybury, M.Inst.C.E., formerly chief engineer of the Road Board, will become acting secretary and manager on his return from Egypt, after a brief holiday. For over two years he has had charge of the road battalions working on the British front in France and Flanders. With the advance into the occupied zone in Germany his arduous work was greatly increased owing to the mining of the roads by the retreating enemy.

Mr. H. H. Gregory has been appointed by the Home Secretary to act as Technical Adviser to the Commissioner of Police on public service motor vehicles. Mr. Gregory is the chief of the technical department of the Royal Automobile Club, a member of the Institute of Mechanical Engineers and the Institute of Automobile Engineers. Upon the imposition of the motor vehicle duties two years ago, he was appointed adviser to the Customs and Excise.

Mr. Richard J. Howley, M.Inst.C.E., has resigned his position as joint managing director of the British Electric Traction Company in order to take up private practice. Mr. Howley will continue to act as chairman of the Potteries Electric Traction Company and of the Birmingham and Midland Motor Omnibus Company and in an advisory capacity to the British Electrical Federation. Mr. Howley's present address is the Manchester Hotel, Aldersgate, E.C., where the British Electrical Federation has temporary offices.

Mr. J. F. Cameron, engineer and general manager of Northampton Corporation Tramways, has been unanimously granted an honorarium of £100 by the Town Council, on the recommendation of the Tramways Committee, in recognition of the valuable services he has rendered under exceptionally onerous conditions during the war. Owing to the shortage of staff at the power station and the increasing difficulties during the war, a large amount of extra work has been thrown upon Mr. Cameron. While influenza was rampant he was obliged temporarily to act as stoker.

Inspector Smalley, who has been in the service of the City of Oxford Electric Tramways Company for more than three years, was recently appointed traffic superintendent of the Musselburgh electric tramways. On leaving he was entertained by the Oxford Finches Musical Society at their headquarters at St. Aldgates, and was presented with a suit case subscribed for by the staff of the tramways company. Mr. Campbell, the traffic manager, congratulated Mr. Smalley on his appointment and wished him success in his new position. Councillor Harris spoke in high appreciation of Inspector Smalley's unfailing tact and the ability he had displayed in the difficult times through which they had passed.

Mr. W. Worby Beaumont has resigned the appointment of Technical Adviser to the Chief Commissioner of the Metropolitan Police on public service motor vehicles and tramway cars, but it is understood that his services will continue to be available as a consultant. Mr. Beaumont has for many years been a member of tramway and motor organisations, and he received the Scotland Yard appointment in 1905. At that time the motor omnibus was an unreliable vehicle, but in 1906 it began to be constructed under regulations which effected considerable improvement. A great step in advance was effected as the result of amended regulations issued in 1909. The weight was reduced to 3½ tons and the running became comparitively noiseless, while the use of oil trays prevented the smearing of the roads with lubricants. The only portion of the regulations which has not been enforced is the clause which requires the use of a speed governor. The 1909 regulations will shortly give place to the amended rules issued in April, 1917, to govern new construction after the war. The chief new requirement entails a further reduction of weight.

Mr. A. A. Blackburn, on leaving his position as chief engineer of the Belfast City Tramways to take up the management of the Huddersfield Tramways, was presented with an illuminated address by the members of the staff at Belfast. The general manager (Mr. J. S. D. Moffet), who entertained the subscribers at Ye Olde Castle Restaurant, paid a glowing tribute to the good work done by Mr. Blackburn during the 14 years he occupied the position, first as rolling stock superintendent, and latterly as chief engineer of the Belfast City Tramways, and assured him of the good wishes both of himself and staff for a successful career in his management of the Huddersfield tramways. Mr. Moffet was supported by Mr. H. Vernon (engineering department), Mr. P. Williamson (body shop), Mr. Harrison (overhead department), Mr. T. H. Brennan (stores department), Mr. J. Blemings (chief motor inspector), Mr. S. Carlisle (office staff), Mr. G. Bartley (representing the motormen and conductors), and Messrs, Birch, Hutchinson and Stewart (works department). Mr. Blackburn responded, and thanked those who had worked with him during his term of office for their loyal support and co-operation.

Mr. R. L. Acland, chief electrical engineer to Chesterfield Corporation for the last 18 years and manager of the tramways for nearly as long, has been presented by the staff with a gold watch on leaving Chesterfield to manage a firm engaged in motor transport between London and the West of England. Mr. W. A. Toppin, chief assistant engineer, presided at the gathering. Mr. F. W. Billett who made the presentation, said that while they were glad Mr. Acland was receiving a promotion, they were very sorry to part with him. Mr. Acland had held the scales between the workmen and the Corporation very well indeed. He did not think that in the last 17 years any of those who had served under Mr. Acland could say they had not had fair dealing and justice. On behalf of the staff he wished Mr. and Mrs. Acland success and prosperity, and what was better, health in their new sphere. Mr. Acland, in reply, thanked them for the support they had always given. The position of a manager was not a happy one in this respect—he had to try to

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satisfy the public. One could never do that, but had to do one's best. Then he had to satisfy the committee, and he had always had the benefit of good committees. One thing that had helped towards the success of the undertaking was that the committees put in a manager and they left him to manage, and dealt only with matters of policy. Another section he had to satisfy was the staff, and from the remarks of Mr. Billett, he thought he had been able to carry out that part of the work fairly well. With regard to the future of the undertakings which he had controlled for so long, it was probable that he would remain in touch with the work. Although his new headquarters would be in London, he would be in Chesterfield fairly often. It was probable that Mr. Toppin, chief assistant, would carry on in his place, and he would ask the whole staff to give Mr. Toppin the same loyal support. Miss Robotham, a woman driver, whose plucky action in a car smash a few days previously probably averted a tragedy, was heartily applauded when she rose to present Mrs. Acland with a travelling bag. Mr. R. L. Acland has since been retained as consulting engineer at a salary of £100 per annum.

The death of **Mr. Walter Calvert,** traffic superintendent of Reading Corporation Tramways, occurred during the first week in January. He had been ill for some time. Mr. Calvert was associated with the Norwich Electric Tramway Company for some years, subsequently going to Bournemouth, and thence to Reading.

The Late Mr. Stephen Sellon.—At a meeting of the Executive Council of the Tramways and Light Railways Association, Mr. R. J. Howley, in the unavoidable absence of Sir Arthur Stanley, moved a resolution expressing the sympathy of the Association with the relatives of Mr. Stephen Sellon, who was one of the founders of the Association and a prominent and valued member. Mr. T. B. Goodyer seconded the resolution, which was agreed to by the members silently upstanding. The *Journal of the Tramways and Light Railways Association* for January, alluding to the death of Mr. Sellon, who was one of the vice-presidents of the association, states that the association thus loses one of its earliest and most active members. He was one of the founders of the association in June, 1897, and has ever since taken a prominent part in its work. He was a member of the Council up to October, 1908, when he was elected vice-president and made an honorary member of the Council, whose meetings he regularly attended.

THE RETIREMENT OF MR. W. E. HAMMOND.

Mr. W. E Hammond, traffic manager of the Metropolitan Electric Tramways, Limited, was on Jan. 23 entertained at dinner in the Holborn Restaurant, London, by his colleagues and others on the occasion of his retirement from office. Mr. A. L. C. Fell, general manager of the London County Council Tramways, presided, and among others present were Messrs. H. E. Blain, J. K. Bruce, James Devonshire, T. B. Goodyer, B. C. Godfrey, J. B. McKinnon, A. N. Mason, A. H. Pott, F. Schofield, C. J. Spencer, H. P. Stokes, and W. C. Ullman.

The Chairman mentioned that Mr. Hammond has been actively associated with tramways since the year 1872, and said that if he was made the subject of a cartoon the appropriate title would be "Fares and Time Tables." Mr. Goodyer, in proposing the toast of the guest of the evening, drew a contrast between tramway conditions as they were in Mr. Hammond's youth and as they are now. Among other things, the minimum fare was twopence, bringing a revenue of from 4s. to 5s. per car-mile. Mr. Devonshire and Mr. Godfrey having supported the toast,

Mr. Hammond made a reply which historically as well as personally was of great interest. He said that he joined the London Tramways Company in 1872. This company, it may be recalled, worked the main tramway routes south of the Thames. In 1882 he transferred to the North Metropolitan Tramways Company, which operated the lines north of the river. With that company he remained till 1904, when he joined the Metropolitan Electric Tramways on the electrification work being nearly completed. His retirement from the position of traffic manager dated from December last. In recalling past times, he said that in the days of horse cars large numbers of American horses were brought into this country. Mules also were introduced; small ones worked three abreast, and large ones were driven in pairs. The first car with cross seats on the upper deck was built at Leytonstone. It was sent to Glasgow Exhibition, and was run in the grounds. Subsequently it was put in service between Moorgate Street and the Manor House, and the old knifeboard style of seat was soon after abolished. The N.M.T. introduced "all-night cars," and a universal fare of 2d. single journey, 3d. return. The L.T.C. also ran omnibuses, a very popular service being that from the Elephant to the Bank. When the London County Council became the owners of the southern tramways, they were stopped from working omnibuses. The universal 2d. fare was introduced on the southern lines in 1878, except on the Greenwich section. This fare was afterwards increased for journeys over the bridges by omnibus, and continued many years until the County Council took over the tramways. The 1d. fare started soon after 1879. In 1882 the penny fare was introduced north of the Thames, and the stages were lengthened from time to time on account of omnibus competition till many stages were over two miles long. Electric cars were first introduced on Barking Road and Romford Road. Parliamentary powers were obtained for electric working, but it was subject to the veto of the local authorities, and nothing was done. In 1891 the N.M.T. acquired the lines of the N.L. Suburban Company, and in 1897 the London County Council acquired the London Street Tramways, together with the 1871 lines of the N.M.T., and leased to the N.M.T. Notice of purchase was given in 1892, but the matter was not settled until October, 1897. In 1892 he was offered the post of traffic manager to the L.T.C., but decided to remain with the North Metropolitan. This company's receipts in 1882 were £290,000; in 1901 the total was £757,000. Although he was told at first that more cars could not be turned at Moorgate Street than was already done, they got up to over 90 cars per hour. The Metropolitan Electric Tramways were formed in November, 1902, by acquiring the Middlesex lines of the North Metropolitan, and electrification was begun. The first portion of the electric system was opened on July 22, 1904, and the last on February 20, 1911. In 1904 the receipts were £82,000, and in 1918, £620,000. The first electrification in London was on May 15, 1903, when King George inaugurated the Tooting line of the County Council.

PRESENTATIONS TO MR. F. W. KETLEY.

The staff and employees of Norwich Electric Tramways Company met in the Council Chamber of the Guildhall for the purpose of making a presentation to Mr. F. W. Ketley, who has resigned the position of manager of the company. The Lord Mayor (Mr. G. M. Chamberlin) a director of the company, presided over a large attendance from all departments. Amongst those present were Mrs. Ketley, Miss Ketley, Mr. F. M. Foster (acting manager), Mr. P. F. Robertson (chief clerk), and Mr. R. C. Spicer (Messrs. Culley and Company). In making the presentation the Lord Mayor said it was a very great pleasure to him to be asked to preside over the meeting of the employees, who wished to do honour to their late chief, Mr. Ketley. He went on to speak of the good feeling which had always existed between every member of the staff and Mr. Ketley, and asked him to accept a solid silver tea service of early Georgian design, bearing the inscription:—"Presented to F. W. Ketley, Esq., manager of the Norwich Electric Tramways Company, 1909–1919, by the staff and employees as a mark of affection and esteem."

Mr. Ketley, in responding, said he felt honoured by the presence of the Lord Mayor, thanked him for his very kind remarks, and incidentally mentioned that the Lord Mayor was the first friend he made in Norwich. He then thanked the staff for the handsome present they had made him. It was especially valuable in his eyes because it was of Norwich workmanship and from old Norwich patterns. A manager invariably got the sort of staff he deserved, and it would appear that he must have deserved a great deal to have such an excellent staff about him as he had had, the members of which he looked upon as the best "pals" he had ever had. Taking each department in turn, he thanked the heads and their staffs for their loyalty to him, and for the hard work that they had put in during his term of office. Mr. Foster moved a vote of thanks to the Lord Mayor for presiding and making the presentation. This was seconded by Mr. Spicer, and the Lord Mayor, after acknowledging the vote, called for cheers for Mr., Mrs., and Miss Ketley.

Especially pleasing to a tramway manager was another presentation which has been made to Mr. Ketley. He was presented by the members of the Norwich City Police Force with a silver cigarette box bearing the inscription, under the city arms, "F. W. Ketley, manager Norwich Tramways, from the Norwich City Police as a mark of esteem and appreciation, 1909–1918." The ceremony took place in the parade room, where there was a strong muster, all sections of the force being represented. The Chief Constable (Mr. Dain) said they had invited Mr. Ketley there to wish him a very happy Christmas and a prosperous New Year, and to say good-bye and God speed to an old and true friend. During the years Mr. Ketley had been manager of the tramway company his relations with the police had been of a most cordial nature, and they would ever hold him in pleasant remembrance. He hoped the cigarette box would in years to come remind Mr. Ketley of the agreeable time he had spent in Norwich and of his friends the city police force.

In responding, Mr. Ketley said the presentation came to him as a very pleasant surprise. He had always been on excellent terms with the police, although before he came to Norwich the relationships between the company and the force were not so good as they might have been, and indeed ought to have been for the sake of the citizens generally. He had no notion what the trouble was, for he had found no better friends anywhere than in the Norwich police, and he was glad to believe that that gift showed that the good feeling between him and them existed up to the end. He had the greatest admiration for the Norwich police and for the way they carried out their work.

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TRAMWAY AND LIGHT RAILWAY NOTES.

AYR.

INCREASED PREMIUM FOR ACCIDENT INSURANCE—TROLLEY WHEEL MILEAGE.

The Law Accident Insurance Society have informed Ayr Corporation that for three years ended Whit-Sunday, 1918, the claims paid amounted to £927, whereas the insurance premium was only £589. They were prepared to renew the policy for another year at an increase of 33⅓ per cent. on the premium, the present rate being 22s. 6d. per cent. The Council decided to renew the policy for a year on the terms proposed, and have agreed to the suggestion of the company that the Corporation should employ a thoroughly qualified independent tramway engineer to make an examination of the whole plant, overhead wires, cars, etc., and to state whether in his opinion the inspection and repairs are efficient. The general manager of Glasgow Corporation Tramways, or, failing him, the general manager of Leeds Corporation Tramways, is to be asked to recommend a suitable engineer to make the inspection and to report thereon. During the last year 182 trolley wheels were used on the Corporation tramways, the average mileage obtained being 4,043, a very good result, as the manager remarks, on a system with so much side running.

BELFAST.

STAFF FOR PERMANENT WAY UPKEEP—SIX-DAY WEEK FOR EMPLOYEES.

The Tramways Committee have received from the general manager (Mr. J. S. D. Moffet) a report upon the staff he would require in connection with the permanent way upkeep, which, under the reorganisation scheme, has been taken over by him. The committee decided to recommend the Council to authorise them to appoint an assistant permanent way engineer to be responsible to the general manager for the general maintenance and upkeep of the track. The Corporation have granted the employees of the tramways department a working week of six days instead of seven.

BIRMINGHAM.

PRAISE FOR WOMEN CONDUCTORS.

According to the *Birmingham Gazette*, the women conductors at Birmingham have with few exceptions "made good." Many of them express regret that it will soon be necessary to give up their employment owing to the return of the men. The average earnings of those working on a seven hour shift are about 30s. a week, while those who work longer shifts and overtime sometimes earn as much as £4 a week.

BLACKPOOL.

THE PURCHASE OF THE TRAMWAYS COMPANY'S UNDERTAKING.

A difficulty has arisen between the Blackpool Corporation and the Fleetwood Council with reference to the purchase of the Blackpool and Fleetwood tramroad. As a considerable part of the undertaking is in the Fleetwood district, the Council consider that they should join in the purchase and become part owners of the tramways. The Blackpool Corporation, however, have refused to agree to the proposal. Fleetwood Council intends therefore to oppose the Bill which the Blackpool Corporation are promoting in Parliament to obtain powers to purchase the undertaking. The purchase price has been fixed by agreement at £235,000, and in addition the Corporation will pay the company £13,758, representing the purchase price of £14,000 six months' Treasury Bills invested by the company out of the profits earned in 1917, but since realised to meet current liabilities. A further £4,000 will be paid by way of compensation to the directors and the general manager and secretary for loss of office, and the Corporation will assume responsibility in connection with the outstanding £35,000 5 per cent. mortgage debentures, redeemable in 1928. Excluded from the purchase are the invested funds of the company, amounting to £42,052, and sufficient cash to pay the declared dividend for the half-year ended December 31, 1917, on the share capital. Blackpool Corporation propose to construct new tramways at a cost of £7,400, a further £1,100 being required for providing electrical equipments and £7,000 for carrying out various street improvements.

BRIGHTON.

GENERAL MANAGER HEADS A QUEUE AT DICK, KERR'S WORKS.

Mr. William Marsh, engineer and manager, Brighton Corporation Tramways, has advised the Council to spend about £6,200 on new car motors. Mr. Marsh states that he had taken the first place in the waiting queue at Messrs. Dick, Kerr and Company's works for sixteen car sets or thirty-two motors, subject to agreement as to price. Messrs. Dick, Kerr and Company have offered forty car motors at £300 per car set. Delivery is expected to begin early in May, and to continue at the rate of eight motors per fortnight. The price for a complete car equipment is £450, as compared with £273 10s. in June, 1914, an increase of 64 per cent. Mr. Marsh advises the acceptance of the offer of the twenty car sets at £300 per car, and also the necessary number of gear cases at about £10 per car extra.

CHESTERFIELD.

PRESENTATION TO A WOMAN CAR DRIVER.

Miss Robotham, a driver on Chesterfield tramways, has been presented with a cheque for £2 by the Tramways Committee and an insurance coupon in recognition of courageous conduct. Alderman Rhodes, in making the presentation, said that Miss Robotham recognising that a collision was unavoidable, knocked on one side the learner, who was driving, and applied the brakes. The car was pulled up before another car dashed into it. The committee, he said, commended her on her conduct, her presence of mind, and her nerve, for she undoubtedly prevented a very serious accident. As a member of the committee, and as a frequent user of the cars, he could say that the girls, as drivers and conductors, had discharged their duties most satisfactorily.

DUNDEE.

WHOLE DAY SERVICE ON SUNDAYS—EMPLOYEES' PASSES WITHDRAWN.

The magistrates have agreed to allow the Dundee, Broughty Ferry and District Tramways Company to run a continuous service on Sunday, cutting out the present stoppage between 11 a.m. and 1 p.m. The company had intimated that if the request were not granted the directors intended to arrange not to begin the service until 1 o'clock in the afternoon. Mr. G. A. Johnston, convener of the Dundee Tramways Committee, has informed the Corporation that the committee had no objection to the change, and they would themselves be making a similar proposal. Mr. Peter Fisher, general manager of the Corporation tramways, remarked that it would be a great advantage to have a continuous service. Dundee Tramways Committee have refused a request of the employees at the central depot for free passes to and from their work. The privilege had recently been withdrawn owing to its misuse.

GLASGOW.

THE NEW PARCEL SERVICE—TRAFFIC DURING THE NEW YEAR HOLIDAYS—SALE OF PAMPHLETS ON THE CARS.

The parcel service which was begun a few weeks ago is at present limited to carriage between two receiving stations. It is thought that the service will be made more popular by a distribution of parcels to consignees at the Uddingston end, and it is possible that arrangements will be made for this. To cope with the extra traffic on the Corporation tramways during the New Year holidays there was a great increase in the number of cars. This is indicated by the car miles run in the first week of January, the total being 576,883, which was 85,146 miles more than in the preceding week, and 8,686 more than in the corresponding week twelve months ago. The passengers numbered 9,089,492, an increase of 535,071; while the receipts were £31,100, as against £29,947. At a meeting of the City Council an objection was taken to the practice of selling pamphlets on the Corporation cars. The proceeds of the sales are devoted to war relief funds, but the point was raised that the opinions expressed on some of the topics dealt with did not represent the views of the majority of the people. An assurance was given that when the balance of the pamphlets was disposed of, the sales would cease.

HULL.

OVERHAUL OF TRUCKS, ELECTRICAL FITTINGS, AND OVERHEAD EQUIPMENT.

The tramway electrical engineer has reported to the Hull Corporation Tramway Committee that owing to the severe stress and strain put on rolling stock and overhead equipment during the four years of the war, and the difficulty in obtaining labour and material, he had been unable to keep up the pre-war standard of maintenance, and it will now be necessary to make a thorough overhaul, particularly of the trucks, electrical equipment and fittings, etc., of the overhead equipment. The engineer is re-adjusting demobilised employees with a view to carrying out this work as quickly as possible.

LEEDS.

EXTENSION OF THE PARCEL SERVICE—THE CORPORATION BILL.

The Corporation tramways parcel delivery system has been extended. There is now a through service between Leeds, Bradford, Halifax, and the heavy woollen district. Leeds Corporation Bill has been reported by the Examiner of Private Bills to have failed to comply with the standing orders in respect of the proposed tramways in Middleton, the opponents contending that the construction of the tramways requires the consent of the local highway authorities, which has so far been withheld. The chief purpose of the Bill is the acquisition of 400 acres of land at Middleton for the purpose of a housing scheme, and it is thought that this portion of the Bill is not endangered.

LIVERPOOL.

INCREASED TRAFFIC AND DECREASED CAR MILEAGE—A NEW SHELTER.

At the meeting of the Liverpool Tramways Committee on January 9, Alderman Russell Taylor, referring to the prosperity of the undertaking, said that the increased revenue must not be regarded as profit, as wages had risen greatly and the cost of materials was much higher. Alluding to the great increase in traffic, he expressed

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the hope that the public would give the committee credit for doing the best they could in providing facilities under difficulties. The returns for the year showed that the receipts amounted to £961,022, an increase of £142,955 over those of 1917. The passengers aggregated 195,082,609, an increase of 22,240,115, while there was a decrease in the mileage of 419,814. The Liverpool Tramways Committee have consented to erect a shelter for waiting passengers at the Old Swan terminus.

LONDON.

Campaign for Observance of By-Laws—Boroughs Pressing for New Tramways—Awakening to the Capital's Needs—Motormen in County Court Actions.

It was reported to the London County Council on January 22 that one person had been fined for obstructing the Council's cars, several had been given the option of paying a fine or undergoing a term of imprisonment for assaulting officials, two persons were fined for travelling beyond the distance for which they had taken their tickets, one for refusing to pay his fare, and no fewer than nineteen persons were fined for spitting on tramway cars. Ununiformed officials are employed to detect offenders. At a conference of representatives of Woolwich, Greenwich, and Deptford Councils with members of the Housing Committee of the London County Council, it was suggested that a new tramway route should be made connecting New Cross Gate with Kidbrook and Eltham Road. The chairman of the Highways Committee promised that the tramway from Lee Green to Eltham would be the first care when conditions allowed. It was arranged to hold another conference of the three boroughs shortly to consider improved means of transit for the districts concerned. The *Daily Chronicle* asks for a settlement of the London traffic question as between tramways and omnibuses, and for the absurdity of the numerous dead-ends to be dealt with. Our contemporary adds:—"A good deal is said about the ugliness of tramways, but other cities, municipally better managed than London—Glasgow, Liverpool, and Birmingham, for instance—contrive to bear with them, and the object lessons we have had lately in the inadequacy of our transport must have their effect." Judge Graham, in Bow County Court on January 17, awarded a motorman of the West Ham Corporation Tramways 30s. and costs for wear and tear of his personal clothing, to which he contended that he was entitled owing to the fact that he was not supplied with a uniform from the time he entered the employment of the Corporation in February, 1918, until the following August. At the same Court Judge Graham gave a verdict for West Ham Corporation in an action brought by a motorman who had disobeyed an order to drive a car that in his opinion was defective. The motorman sued for a week's wages and another in lieu of notice, alleging that he could not sound the gong of the car, as the gong pin was too short. For the defence it was shown that the car was taken to a depot a mile and a half away, where an examination showed that there was nothing wrong.

MANCHESTER.

One Hundred Cars Under Construction—A Point in Accident Liability.

The construction of one hundred new cars has been entered upon in the car building shops of the Corporation tramways. In our issue of January 25 the Tramways Committee advertised for car motor and trucks. The deputy Town Clerk has prepared a report for the Tramways Committee dealing with the legal position towards passengers in view of the recent decision of Mr. Justice Bailhache in an action brought against the Corporation by a lady. The judge held that the plaintiff was not entitled to compensation for the accident, because she rose from her seat at the front of the car preparatory to leaving the car when the car was some 70 yards from the stopping-place. The deputy Town Clerk said that the law does not state what precise interval of time shall be allowed between the stopping and starting of a car, and the Tramways Committee would, he thinks, be wise not to try to do what the law has not done. What was reasonable in such matters was a question for judges or juries to determine. In reply, Alderman Bowes, chairman of the Committee, said that they could not say that a certain time should be allowed for passengers to get on or off, because twenty active men might take less time than two or three aged ladies. When they were able to secure the return of the men from the services, the committee would no longer be compelled to employ some persons who were not best fitted for the work.

PLYMOUTH.

Third Party Insurance.

Plymouth Corporation has rejected the Tramway Committee's recommendation that the Corporation should insure against third party risks. The committee were about evenly divided, and there was a sharp difference of opinion in the Council.

READING.

Increased Fares to Meet Cost of Wages Increase.

As a result of the effect which the wages award has had on the financial position of the tramway undertaking, the Corporation propose to raise the fares by 100 per cent. in some cases, and 50 per cent. in others.

RHONDDA.

Through Running to Pontypridd.

The Board of Trade having held that a case has been made out for through running between Pontypridd and Rhondda, an agreement for this purpose has been made between the Rhondda Tramways Company and the Pontypridd Council. The first car was run for experimental purposes on the afternoon of January 2, and proved that the Pontypridd tracks are suitable for the Rhondda cars.

SUNDERLAND.

Forty-seven Hour Week for Depot Labourers.

The Tramways Committee have conceded the 47-hour week to the labourers employed at the Hylton Road depot, but have refused to introduce the two-break system demanded by the skilled artisans.

SHEFFIELD.

Plans for a Tramway Subway.

A draft scheme for a tramway subway in the centre of Sheffield has been considered by the Improvements Committee.

TYNEMOUTH.

Proposed Purchase of the Tramways.

Tynemouth Town Council are promoting a Bill providing for the acquisition and extension of the undertaking of the Tynemouth and District Tramways Company.

YORK.

Penny Stage Retained.

York Council have decided to retain the penny stage. Councillor Horsman, in making the proposal, said that while the receipts showed an increase of £200 per week, less passengers were carried. Alderman Inglis, who seconded, said that while many people would not bother about spending a penny, they would consider a fare of three-halfpence a waste of money. It was easy to devise a scheme under which the penny fare could be retained.

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And all Engine Room Stores
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PATENT LIST.

Abstracted for "The Tramway and Railway World" from the Official Journal of Patents.

***** If the inventions have been communicated the names of the communicators are given in italics.**

Applications for Letters Patent.

The number of the patent is given in brackets.

Motor car bodies (171)—G. Bowman.
Wheels for motor vehicles (264)—F. W. Brampton.
Tin feeler gauge for motor cars (269)—J. Bray.
Wheel rims and wheels for motor vehicles (292)—J Cooper and Grimston Tyres Limited.
Driving gear for motor vehicles (206)—J. J. Daniels.
Automatic lifeguard for motor vehicles (181)—W. C. Hockey.
Driving and speed controlling mechanism for automobiles (64)—F. W. Howorth (*M. J. Huggins*).
Wheels and tires for motor cars (29)—J. Jack.
Switch operating mechanism for railroads (220)—B. E. D. Kilburn (*Bethlehem Steel Company*).
Apparatus for lighting motor wagons, etc., with varying steam power (33)—C. L. Kirk.
Radiators for water-cooled engines used on motor-propelled vehicles (198)—C. McManus.
Means for adjusting position of gear boxes on motor vehicles (102)—E. C. Middleton and Triumph Cycle Company.
Automobile vehicles (236)—U. Pavesi.
Bodies and body parts for motor vehicles (42)—Regent Carriage Company and M. L. Scarff.
Motor car bodies (171)—R. C. Robb.
Change speed gearing (239)—M. Rose.
Means of fixing rails to concrete sleepers (207)—D. H. Stent.
Reinforced concrete sleeper for railways, etc. (208)—D. H. Stent.
Clutches for motor vehicles (297)—W. N. Baker.
Variable speed gear (727)—A. R. Bannister and J. L. Bisset.
Motor vehicles (661)—H. Weld-Blundell.
Bodies of motor, etc., vehicles (568)—F. M. Charles.
Automobile vehicles (766)—M. A. Delque (Habans).
Railway train systems, etc. (534)—W. Aitken.
Variable speed gears (649)—R. Lindsay.
Brake gear (574)—C. Markham.
Creep anchors for rails (482)—F. R. Morgan.
Automobile vehicles (766)—C. M. Motte.
Gears for vehicles (502)—C. F. Ryland.
Motor bodies (634)—W. H. Sadgrove.
Wheels for motor vehicles (548)—J. D. Siddeley.
Devices or apparatus for measuring speed of vehicles (648)—J. B. Tucker.
Means for lifting vehicle wheels or axles (348)—W. Watson.
Construction and control of change speed gears (458)—J. Yoxall.
Automobile air brakes (908)—C. T. Alexander.
Electrically-driven vehicles (1,009)—A. R. Angus.
Lifting jacks (1,186)—J. Baron (*S. Baron*).
Temporary axles for motor vehicles (1,045)—J. B. Brown and P. Lister.
Speed indicator (991)—B. C. Bucknall.
Track appliance for automatic train stops (895)—M. B. Bulla.
Variable speed and clutch mechanism (1,152)—S. F. Burgoine and H. F. Field.
Means for indicating route and speed of motor vehicles (1,332)—F. H. Cave, G. G. C. Pigott, and C. J. Stewart.
Fluid pressure braking apparatus (1,169)—J. W. Cloud.
Signals for automobiles (905)—S. Cohn.
Automobiles (887)—O. A. Janemian.
Trolley wheel mechanism of overhead electric tramway systems (1,044)—W. R. Jenkinson.
Device for facilitating steering and controlling of motor, etc., vehicles (1,022)—W. E. John.
Station or stopping place indicators for vehicles (1,023)—B. E. Nordman and P. H. Walter.
Converting motor car into motor lorry (1,170)—F. Osbourn.
Fluid pressure braking apparatus (873)—A. W. Rendell.
Heat treatment of railway and tramway rails (885)—C. P. Sandberg and H. Scholey.
Device for reducing or multiplying speed (1,274)—E. J. A. Schultz.
Variable speed gearing (880)—S. Sheen and W. W. Timewell.
Springing of road and rail vehicles (1,164)—J. G. P. Thomas.
Means for locking motor vehicles, etc. (1,269)—A. G. Turner.
Means for stopping trains and detecting signal over-running (1,021)—J. S. Withers (*B. N. Rao*).
Hub cap and pump for automatic lubrication of chambered wheels of tramway, etc., vehicles (1,611)—T. Abbott.
Transmission gearing for motor vehicles, etc. (1,804)—Arrol-Johnston, Ltd., and G. W. A. Brown.
Automatic brakes for trailers, etc. (1,695)—S. G. Ashly and V. Barningham.
Resilient wheels for motors (1,624)—W. H. Bailey.
Motor tires, etc. (1,758)—E. S. Brown.
Door controllers for railway, etc., vehicles (1,494)—C. C. Champeney and F. W. Marillier.
Vehicle wheels for automobiles (1,435)—J. H. Delattre.
Automobiles (1,853 and 1,855)—G. N., Limited, and H. R. Godfrey.
Road wheels of automobiles, etc. (1,383)—E. F. Goodyear.
Preventing wheels of motor vehicles splashing mud etc. (1,396)—C. Guise and T. J. Southall.
Vehicle bonnets (1,438)—G. H. Lanchester and Lanchester Motor Company.
Change speed mechanism (1,443)—A. B. Landis.
Device for pulling off wheels of motor vehicles and preventing water entering wheel covered by a disk (1,681)—N. D. Levin.
Automatic couplings (1,816)—A. Main and H. Woodgate.
Overhead or elevated rail tramways, etc. (1,519)—S. A. Rogers.
Shelter for passengers on road vehicles (1,386)—W. Stone.
Anchorages for railway tracks, etc. (1,645)—O. Valeri.
Chairs for rail joints (1,371)—F. S. Wigley.

Specifications Published.

1917.

Variable speed device (18,075—*121,184*)—S. Bobrovsky.
Means for supplying fuel, water or oil in connection with the engines of motor cars (9,750—*121,300*)—F. Sage and Company and E. C. G. England.
Brake blocks and linings and clutch linings (12,881—*121,301*)—H. Frood.
Train and like control systems (18,221—*121,327*)—A. Kerr.
Combined internal combustion engines and driving wheels for motor vehicles (18,717—*121,360*)—F. B. Silk.
Gas storage apparatus for motor road vehicles (18,765—*121,514*)—W. H. Bentley.
Change speed gearing (15,544—*121,616*)—Wolseley Motors, Limited, and E. Reeve.

1918.

Automatic indicating apparatus displaying vehicle stopping places (64—*112,620*)—E. Riffard.
Gas producers for propelling vehicles (15,900—*121,446*)—D. J. Smith.
Rail joints (7,227—*121,564*)—G. Hughes (*J. M. Phinous and G. E. Shorter*).
Excess speed alarm for tramway cars (38—*121,645*)—H. S. Dix, J. T. Pryor, and C. Coffey.
Means for raising tramway cars from the rails (241—*121,646*)—J. Hoggett.
Lifting jacks (2,841—*121,671*)—R. W. Maudslay and Standard Motor Company.
Spraying apparatus for use upon automobiles for laying the dust raised on the roads traversed (10,842—*121,699*)—J. A. Vanrossum and H. A. Bull.

TENDERS INVITED.

CITY OF BIRMINGHAM TRAMWAYS DEPARTMENT.

Electric Tramway Cars.

The Tramways Committee are prepared to receive Tenders for the Supply, Delivery, and Erection of Additional Rolling Stock.

A form of tender, with instructions, general conditions, specification, and drawings can be obtained on application to the undersigned at the Tramway Offices, the Council House, Congreve Street, Birmingham, on payment of £2, which will, after the Committee shall have come to a decision upon the tenders received, but not before, be returned to the tenderer, provided he shall have sent in a bona-fide tender.

Persons tendering must at the time of tendering and at all times during the execution of the work be paying all their workpeople (except such as may be employed under special provisions agreed upon by the employers and the local organised bodies of workers) not less than the Trade Union or Standard Rate of Wages in the several districts where the workpeople are actually engaged in the execution of the works, and must also be observing the hours and conditions of labour, as well as the aforesaid rate of wages, recognised by the Associations of Employers and the Local Organised Bodies of Workers in the various trades in the several districts where the works are being done. The tender of any Contractor who does not pay the Trade Union or Standard Rate of Wages or observe similar conditions in his ordinary business will not be accepted.

Tenders must be enclosed in a sealed cover, addressed to the Chairman of the Tramways Committee, the Council House, Congreve Street, Birmingham, and endorsed in the left-hand corner "Tender for Rolling Stock," and must be handed in not later than 10 o'clock on Wednesday, the 5th March, 1919.

The Tramways Committee do not bind themselves to accept the lowest or any tender.

ALFRED BAKER,
General Manager.

Tramway Offices,
The Council House,
Congreve Street, Birmingham.

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TRAFFIC RETURNS.

Tramway and Omnibus Undertakings in the United Kingdom.

NAME OF COMPANY OR CORPORATION.	1918. WEEKS ENDED. Jan. 5	Jan. 12	Jan. 19	Jan. 26		1919. WEEKS ENDED. Jan. 4	Jan. 11	Jan. 18	Jan. 25		AGGREGATE. Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Aberdare U.D. Council	507	440	430	452	...	615	536	526	538	...	41	21,511	—
Aberdeen Corporation	2.496	2.182	2.020	2,050	...	2.775	2,870	2.552	2,495	...	34	88.831	+ 13,380
Ayr Corporation	430	321	291	319	...	507	424	431	395	...	36	22.262	+ 4,708
Belfast City	...	...	...	...	...	...	...	...	...	...	—	—	—
Birkenhead Corporation	1.811	1.766	1,811	1,934	...	2,137	2,214	2.139	2,088	...	43	94.325	+ 14.882
Blackburn Corporation	1,687	1.224	1.244	1,378	...	1,212	1,086	1,181	1,538	...	43¾	76,504	+ 12 437
Bradford Corporation	7.812	7.086	6.588	7,472	...	8,710	9,346	9.677	9.051	...	43	398.856	+ 69,093
Burnley Corporation...	1.995	1.790	1,718	2,060	...	2,268	2,493	2.661	2 501	...	—	—	—
Burton-on-Trent Corporation ...	345	344	372	370	...	441	435	425	412	...	43	17.823	+ 4.061
Bury Corporation	1.698	1.357	1.415	1.597	...	2,119	2.020	1,970	1.928	...	43	87,994	+ 17,238
Chatham and District	578	1 473	1.057	1.176	...	899	1.520	1,183	1.228	...	3	3,930	+ 224
Cork Electric	300	726	531	577	...	427	679	554	563	...	3	1.796	— 38
Derby Corporation	1.276	1,114	1.129	1.245	...	1,487	1.434	1,458	1.445	...	43	64,562	+ 12,196
Dundee City	1.820	1.595	1.413	1.486	...	2.167	2.179	2 011	2.042	...	36	70 438	+ 14.280
East Ham Corporation	1.197	1.194	1,215	1.267	...	1.689	1 586	1.567	1.500	...	42½	67.361	+ 8 589
Glasgow Corporation	29 947	24.874	21.965	24.081	...	31.100	28,912	29.002	27.752	...	34½	980,683	+ 79,979
Glossop (Urban Elec. Supply Co.)...	184	170	157	177	...	182	210	210	211	...	4	812	+ 124
Halifax Corporation	2,570	2 092	1,851	2.025	...	2.931	2.347	2.777	2.775	...	42½	120.190	+ 16.202
Halifax Corp. Motor Omnibuses ...	58	48	40	47	...	76	54	69	72	...	42½	2,845	+ 768
Huddersfield Corporation	3.094	2.893	2.856	3.238	...	2.621	3.675	3.739	3.608	...	43	156,212	+ 20.443
Ilford U.D. Council	...	...	...	...	...	...	...	...	...	...	—	—	—
Ipswich Corporation	558	555	535	583	...	715	643	671	654	...	43	32.294	+ 3,587
Isle of Thanet	164	164	178	197	...	371	304	318	282	...	16⅔	5.241	+ 2,412
Kilmarnock Corporation	315	203	198	219	...	403	293	279	281	...	36⅔	9.743	+ 2.252
Lanarkshire	2.009	4.986	2.450	2.399	...	2.962	5.888	3,587	3,509	...	3	12.984	+ 3,149
Lancashire United	...	...	...	...	...	...	...	...	...	...	—	—	—
Leeds City	10.866	10 209	10.324	11.057	...	13,397	13,917	13.744	13.454	...	43	581,497	+108,966
Leicester Corporation	3,985	3,965	4.256	4,227	...	4,970	4 832	4,889	4 838	...	—	—	—
Leyton U.D. Council	1.721	1,639	1.671	1,667	...	2,629	2.539	2 459	2 437	...	43	102.079	+ 21.417
Liverpool Corporation	16.291	15,717	15,637	16.454	...	20.060	20.272	19.882	19.221	...	3½	71,324	+ 13 491
Llandudno and Colwyn Bay ...	243	196	202	214	...	346	292	304	290	...	8	2.381	+ 597
London County Council	52.474	50.471	52.610	53.548	...	69.720	71,013	69,410	69,004	...	42½	2.817,027	+473.427
Maidstone Corporation	288	242	231	248	...	363	312	276	278	...	42½	12.227	+ 1.673
Manchester Corporation	22,445	21,663	21,722	23,382	...	25,515	26 399	27,089	26.996	...	43	1,121,032	+220,282
Newcastle-on-Tyne Corporation ...	8.149	7,444	7,472	8,319	...	8.133	8.720	8,385	7,969	...	43	384,905	+ 47.657
New St. Helens and District ...	...	...	...	...	...	...	...	...	...	...	—	—	—
Northampton Corporation	861	812	757	879	...	1,069	960	987	967	...	42	37.937	+ 1.731
Nottingham Corporation	4.602	4,489	4,526	5,061	...	5,961	5.848	5.978	5.966	...	43	246.523	+ 54,509
Oldham Corporation	...	...	...	...	...	...	3.510	3.573	3,441	...	—	—	—
Reading Corporation	1,049	1,043	1,025	1,140	...	1.248	1 218	1,310	1.327	...	42½	55.576	—
Rhondda Tramways	1.587	1,391	1.411	1,472	...	2.191	2.102	2.099	2.113	...	3	6.899	+ 2.178
Rotherham Corporation	1.854	1,794	1 872	2.055	...	1.858	1.984	2,036	2,074	...	43⅔	100.187	+ 20 772
Sheffield Corporation	12.314	11.946	12.081	13.167	...	11.669	12.885	12.939	12.766	...	43⅚	581.924	+ 50.879
Southampton Corporation	2.113	2 043	2,089	2.239	...	2.385	2,389	2 379	2 339	...	42½	108.036	+ 19 801
Southend-on-Sea Corporation ...	619	534	629	657	...	1 296	1.095	1,103	1,109	...	43	56.903	+ 18.776
South Shields Corporation... ...	1,072	962	953	1,023	...	1,154	1,135	1.105	1,128	...	43	49,490	+ 8 330
Sunderland Corporation	2 056	1.770	1.875	2.113	...	2.559	2.404	2,431	2,332	...	43	94,040	+ 14,196
Swindon Corporation	283	262	269	285	...	352	309	308	314	...	42½	13.498	+ 1.880
Torquay Tramways	673	620	611	629	...	895	735	739	743	...	3	2.458	+ 404
Tyneside Tramways and Tramroads	892	719	705	...	...	922	860	840	...	...	3	1.831	+ 136
Wallasey Corporation	1,476	1.368	1.350	1.445	...	2.005	1.961	1.932	1.848	...	42½	80 769	+ 13.100
Walsall Corporation	1.027	983	1.016	1.076	...	1.312	1.257	1.284	1.265	...	43	53.437	+ 10.506
Walthamstow U.D. Council ...	1,079	1,043	1.110	1.189	...	1,467	1,379	1.358	1.307	...	43	62.136	+ 9.718
Warrington Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
West Ham Corporation	3.412	3.300	3,472	3,769	...	4.892	4.721	4.693	4,561	...	42½	195,823	+ 39.308
Wigan Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—

*** A number of undertakings have suspended the issue of traffic returns for the duration of the war.

Colonial and Foreign Tramway Traffic Returns.

NAME OF COMPANY.	1918. WEEKS ENDED. Jan. 5	Jan. 12	Jan. 19	Jan. 26		1919. WEEKS ENDED. Jan. 4	Jan. 11	Jan. 18	Jan. 25		AGGREGATE. Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Anglo-Argentine	53.008	54.406	52,850	49,151	....	60,067	24.160	54 003	54.769	...	4	192.999	+ 16,416
Calcutta ... ... Rs.	76.589	74,044	75.379	71.406	....	87,061	88.190	88,807	82.787	...	3½	314,541	+ 48,677
Madras ... ... Rs.	....	....	....	....	....	....	....	....	....	...	—	—	—
Pernambuco	5,467	4.651	4.881	4.495	....	5.734	5.117	5.275	5.146	...	3½	19.625	+ 879

Companies issuing Monthly Statements only.

	1917. Aug.	Sept.	Oct.	Nov.	Dec.	1918. Jan.	Aug.	Sept.	Oct.	Nov	Dec.	1919. Jan.	Wks.	AGGREGATE. 1918.	+ or −.
	£	£	£	£	£	£	£	£	£	£	£	£		£	£
Ballarat & Bendigo	2,766	3,072	3,546	3.405	...	...	2,996	3,430	3.690	3.570	...	...	32	27,090	+ 1,512
Brazilian Trac. Mlrs	8064000	7925000	8006000	7.695000	...	...	9491000	9081000	8052000	7581.000	...	...	47	93,363,000	+9,232,000
Brisbane	36.925	31,600	33,580	32.901	35.019	...	42.670	35,400	36,780	39,246	38.135	...	52	440,014	+ 43,675
British Columbia	$454,425	457,709	491,964	525.629	...	...	544,339	575,476	580,354	612.893	...	...	21	2,727,030	+ 358,925
Buenos Ayres L'c'z.	39,111	33,655	39,067	39,678	40.901	...	41,817	41,006	41,843	42,952	50.460	...	26	259,224	+ 28,748
Burma	26,714	26,167	28,955	27,760	26,224	...	41,855	30,836	34,848	34,407	34,593	...	21	176.539	+ 40,719
Cape Town	15,480	...	17,128	16.522	...	...	19,055	17,872	13,877	18.385	...	...	—	—	—
Carthagena & H....	4,164	4,306	2,805	3,932	4,424	4.011	2,729	2,549	2,525	2,988	2,950	3.655	4	3,655	− 356
Cordoba	14,233	...	...	...	...	...	15,734	...	...	...	...	...	21	79,054	+ 8,740
East India	1,562	1,512	1,229	871	1,099	...	1,975	1,939	2,044	1,947	2.048	...	21	9,953	+ 3,680
Kalgoorlie	2,911	3,063	...	...	...	...	3,340	2.947	...	...	...	...	39	25.070	+ 942
La Plata	4.075	3,450	4.069	3.742	4.606	4.711	4.382	4.999	5.177	5.334	5.792	5,730	4	5.730	+ 1.019
Lima	38,424	35,636	37,612	37,249	...	...	44,711	42,861	45,336	44,948	...	...	48	479,952	+ 82 898
Manaos ...	Rs. 150,657	...	...	...	...	...	132,507	...	...	...	...	...	34	1,152,686	− 83,959
Manila ...	$149,150	152,200	157,400	159,000	...	...	200,000	204 500	214,898	214,292	...	...	48	2,090,630	+ 466 897
Monte Video ...	28.860	29.426	30.153	...	34.025	...	16.937	29,611	33.203	...	38,441	...	8	70.139	+ 5 054
Peruvian ...	$979,430	950,740	1047220	899,680	1101090	1189350	1029610	957,910	1090815	897.090	1057990	1009650	30	7,030,365	− 247,255
Port Elizabeth ...	3,360	...	3,885	3.807	...	...	3,725	3,661	2.751	3 498	...	...	—	—	—
Rangoon	4,788	5,163	5,667	5,358	5,438	...	5,760	6,067	6.566	6,611	6,188	...	52	71,992	+ 11,174
Toronto ...	$1039819	1023517	1043886	1052000	...	...	1070567	1119925	1048478	1071106	...	...	47	11,716,181	+ 729,183
Winnipeg ...	$248,457	267,170	301,772	305.881	...	...	288,974	285,670	295,005	283,721	...	...	47	3,252,863	+ 213,466

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The Daimler Two-Tonner sets the standard for Commercial Motor Vehicles

"AS good as a Daimler" is a well-known phrase of recommendation.

The reliability of Daimler Commercial Vehicles is an axiom in motor transport circles, and their cost of maintenance is the lowest known.

The Daimler is not the only serviceable lorry on the road, but however good other vehicles may be they must all fall short of Daimlers in relation to engine performance and continuity of service.

The Daimler standard of efficiency is only within the scope of the Daimler Sleeve-Valve Engine.

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The Daimler Company Ltd.
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NAPIER

MOTOR VEHICLES.

TWO MODELS

TO CARRY 30/45 CWT. & 3½ TONS RESPECTIVELY

"The Design and Construction are Throughout of a Character, which it would be Exceedingly Difficult, if not Impossible, to Improve Upon."

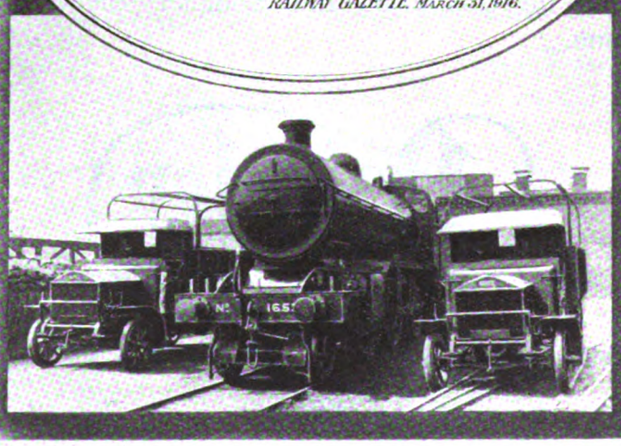
RAILWAY GAZETTE, MARCH 31, 1916.

IN PEACE

USED BY THE LARGEST CARRYING COMPANIES AND COMMERCIAL HOUSES.

IN WAR

USED BY THE BRITISH AND ALLIED GOVERNMENTS.



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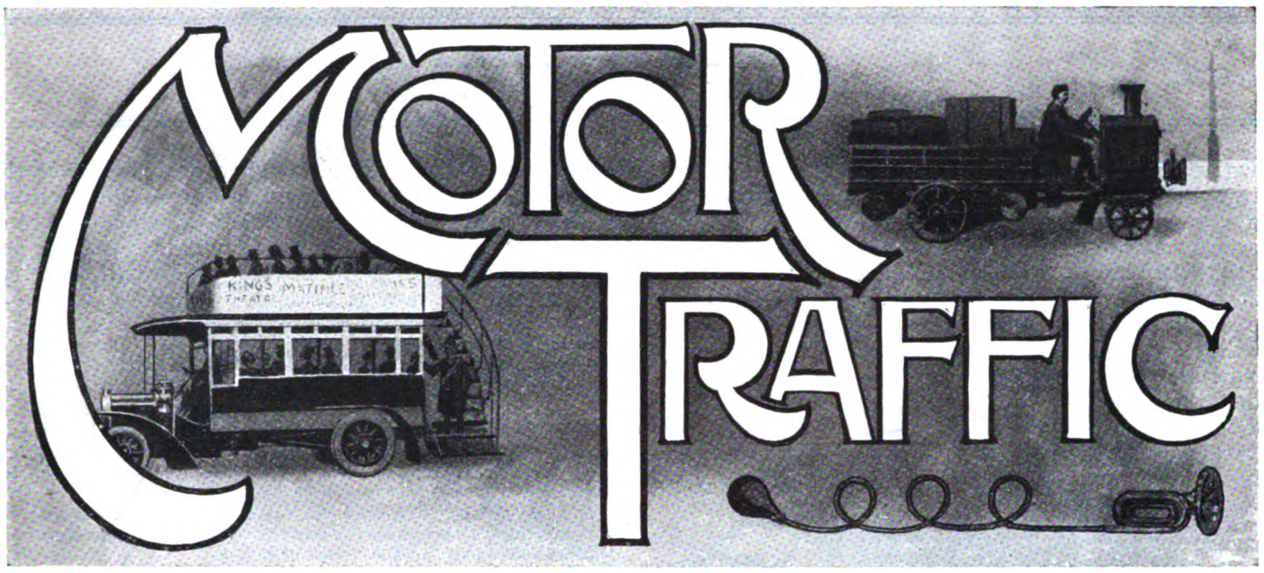

NATIONAL CONTROL OF TRANSPORT.

The Ministry of Ways and Communications, previously referred to as the Ministry of Transport, has become almost, if not quite, an accomplished fact. Sir E. Geddes' new charge should become a great power for good or evil, but that it possesses potentialities for evil is clearly enough illustrated in the resolution which has been passed by the National Council of the Commercial Motor Users' Association. This Council "having considered the proposal to place the control of (*a*) roads and road transport, and (*b*) railways under the same Ministry, is of opinion, the interests concerned being seldom identical and sometimes conflicting, that housing and other national reconstruction programmes, and developments of industrial and agricultural road transportation, are likely to be retarded unless such control be entrusted to distinct and separate Ministries or guarantees of like effectiveness be provided by the Government in any new departmental organisation." This resolution might have been expressed in simpler language, but anyone who reads it carefully will see that it is good at heart if unattractive in form. The danger indicated is a very real one. There are plenty of people who seem to think that the terms "transport" and "railway" are practically synonymous; that a Ministry of Ways and Communications might equally well be called a Ministry of Communications by Railways; that anything in the nature of road traffic is merely a subsidiary which can be classified as an unimportant appendage of the railway system. The new Ministry is to start with a railwayman at its head, but it is to be hoped that railway influence will not permeate the whole structure. If it does there is a serious risk that it may be used as a means of protecting railways against the justifiable and stimulating competition of younger and in some ways more progressive systems of transport. If the railways in their early days were capable of practically killing the canal system without official support, how great must be the danger of the railways, thoroughly officialised, taking up such a predominant position as would hamper very seriously the development of any new competitive method.

RAILWAYS AS USERS OF MOTOR TRACTION.

The railways are themselves considerable potential users of motor traction, and this will complicate the problem of nationalisation. From this fact it seems to follow that if railways are nationalised a percentage of road motor vehicles becomes nationalised also. It is then in the power of the central authority to kill independent competition on the roads by running services at a loss at the expense of the taxpayer. Any protest would be met by the argument that the loss is only apparent; that it is really a gain, inasmuch as road motors increase the traffic of the railways, so the taxpayer has no ground for complaint. There is a good substratum of truth often to be found in this contention, but the danger is that it may be used as a means of employing the taxpayer's money for the purpose of destroying the taxpayer's individual enterprise. A very useful statement made by Mr. Frank Potter before the Select Committee on Transport shows the uses to which the railways put road motors. Thus the Great Western uses road vehicles fairly extensively to develop districts where geographical difficulties make railway extensions improbable or impossible; also as feelers to ascertain whether local traffic can be brought up to the point at which a light railway is justified, and for seasonable services to places of holiday and tourist interest. On some passenger services the road vehicles are constructed to carry luggage, parcels, light goods, and mails. In addition to passenger services, a large number of vehicles are employed for parcels cartage at various big centres; a considerable number are also used for goods cartage. For the former work the majority of the vans are 1-ton vehicles, but the tendency is to employ 30-cwt. vehicles. The representatives of this class in 1915 showed an average cost per mile of just under 4½d., which is certainly very satisfactory. So also was the record for the 3-ton vans during the same year, being just over 6d. In goods cartage the work is heavier and the conditions worse. The majority of the fleet consists of 3-ton, though 5-ton and 30-cwt. lorries are also represented. The average operating cost of the 3-ton machines in 1915 was 7¼d.; of the 30-cwt. vehicle 5½d., and of the 5-ton just under a shilling per mile.

* * * * * *

The efforts that the Great Western and other railways have made in the way of developing rural services for the collection and delivery of farm produce have not met with very much encouragement. It appears that just at first the novelty of the idea brings a certain amount of traffic to a service of this kind, but that after a little interval the traffic falls off, particularly if rather a slack time is reached and the farmers are able to get a fair amount of their work done by their

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MOTOR TRAFFIC

own teams. Apparently the farmers do not consider it worth while to co-operate or to go out of their way to support a motor service, and consequently such a service can only be run at a loss. The conclusion is that there is not much of an outlook in this direction for the use of road motors, unless the State sees fit to subsidise their employment. It would, however, perhaps be unfair to jump to this conclusion. The experiments made by the railways were conducted some time ago. During the last few years the outlook of the farmers has changed materially, and it may be that, if identical experiments were again renewed, the results would be very different from those recorded.

DEVELOPMENT OF NEW INDUSTRIES.

The report of the Engineering Trades (New Industries) Committee has now been published, and will be found very interesting to engineering firms generally, inasmuch as it makes a number of valuable suggestions as to the development of numerous branches of the industry new to this country. The reports of the various Branch Committees are embodied with that of the main committee. The principal work of the Motor Industry Branch Committee consisted in obtaining materials and other facilities to enable motor manufacturers to produce and test experimental models of their post-war products. In dealing with the special circumstances surrounding the industry at the conclusion of the war, it is pointed out that one of the great difficulties lying ahead is that of stabilising the market in face of the big influx of second-hand vehicles. The solution of this problem is now in the hands of the Ministry of Supply. The scheme put forward by the industry, as we have already stated, would provide that the vehicles should be repaired by their original manufacturers and then sold by the manufacturers, acting for the Government. The regular sales organisation of the industry would thus be employed, and the interests of purchasers would be safeguarded, inasmuch as the condition of the vehicles would be guaranteed. We note with interest that the Engineering Trades Committee appears to endorse the view of the Branch Committee to the effect that the motor industry needs protection by means of a substantial tariff for a period of years after complete prohibition of import is removed. Incidentally, it does not look as if the prohibition is likely to come off just at present.

FUTURE OF MOTOR EXHIBITIONS.

There is much talk as to the future of motor exhibitions. While a certain number of those immediately concerned would like to see the old system perpetuated, there are many who feel that the changed circumstances demand that British manufacturers should exercise more control in the organisation and arrangement of their own shows. This does not necessarily mean that the foreigner would be excluded, but more probably that he would come in as a guest rather than as a matter of right. There remains, of course, the question of whether, under these circumstances, the foreign vehicle would be accommodated after space had been provided for all British firms desirous of exhibiting. It is a great pity that there is not a suitable building really big enough for the purpose. For years past would-be exhibitors have been crowded out, and in the future this is likely to occur even more frequently and extensively. Then again, there is the question of what is to happen to the profits accruing from a show. A feeling prevails in some quarters that at least a part of them should be available for expenditure purely in the interests of British industry. This is not the case at present.

C.M.U.A. AND RECONSTRUCTION.

Mr. E. S. Shrapnell-Smith, the chairman of the committee of the Commercial Motor Users' Association, who has for the past year discharged the duties of executive officer of H.M. Petroleum Executive, has issued the following circular letter on behalf of the Association :—

It is my intention to urge the adoption of the following at the first meeting of the general committee (hereafter to be styled the National Council) in the New Year;—

1. Abandonment at the earliest date of petrol licensing and other control measures due to the war.
2. Continuation of pressure to secure lower prices for motor spirit and other fuels.
3. Steps to ensure specifications for petrol and benzol which will guarantee good and uniform quality.
4. Development of all home fuels and their use free of excise duty.
5. Simplification of procedure under which commercial motor users are entitled to recover the petrol tax rebate (now 3d. per gallon).
6. Proceeds of motor spirit tax and vehicle licence duties to be paid into a central road fund and applied to road improvements.
7. Better roads and bridges.
8. Opposition of all unjustifiable bridge and highway restrictions.
9. Speeding-up of terminal services for commercial motors at docks, wharves, warehouses, and goods yards.
10. All road users to be required to conform to adequate lighting regulations.
11. No local tolls.
12. Creation of inexpensive and speedy appeal procedure in cases where authority or discretion concerning licences or routes is in the hands of local councils.
13. Active propaganda work amongst members of Parliament.
14. The simplification and codification of highway, traffic, and motor vehicle law.
15. Permanent strengthening of the Association's central defence fund.
16. Divisional and area organisations for members with local self-government.
17. Extension of Association's provision for independent expert engineering advice, examination, and report.
18. Extension of the Association's scheme of approved depots and roadside supply facilities.
19. Extension of the Association's free legal advice and defence.
20. Extension to the provinces of the Association's examinations for drivers.

LONDON REGISTRATION OF MOTOR CARS.

The Public Control Committee of the London County Council have submitted the following particulars of registrations effected and licences issued under the Motor Car Acts during the three quarters ended September 30, 1918 :—

Quarter ended	Mar. 31, 1918.	June 30, 1918.	Sept. 30, 1918.	Total to Sept. 30, 1918.
Motor cars registered	829	1,190	1,073	109,584
Heavy motor cars registered	200	317	202	11,855
Motor cycles registered	384	693	575	54,469
Changes of ownership—motor cars ...	1,275	1,121	1,182	48,663
Changes of ownership—motor cycles ...	307	295	297	27,191
General identification marks issued ...	99	72	69	—
Copies of entries in register furnished	107	110	140	—
Licences to drive issued	9,431	12,031	11,591	593,805
Duplicate licences granted	131	147	170	—

BATTERY TRACTION FOR TRAMWAY UNDERTAKINGS.—A 2-ton road chassis has been delivered for the Christchurch Tramway Board (N.Z.), and fitted with a 20-passenger body for service on the Sockburn-Hornby route. Two batteries are being used on this omnibus, so that one can be charged while the other is in use.

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THORNYCROFT DEVELOPMENTS AT BASINGSTOKE.

At the invitation of the directors of Messrs. J. I. Thornycroft, Limited, a party of newspaper representatives recently inspected the company's motor works at Basingstoke. The visitors witnessed the various processes of manufacture of the latest types of vehicles which have earned such a high reputation in every department of national service. Messrs. Thornycroft were amongst the pioneers of industrial motor vehicles, and since 1899 have supplied machines of various types to the several Government departments, as well as to railway companies, municipal authorities, and general industrial undertakings.

During the war practically the whole of the firm's output of road motors was taken by the War Department, and although the complete range of Thornycroft models include a 30-cwt chassis and one designed for a net load of five tons, for the past four years the whole of the motor department's resources have been concentrated upon the production of two models only. These are listed respectively as "J" and "X" types, the former being the well-known War Office model, of which some thousands were supplied for use with the Allied armies. The "X" type is shown in Fig. 1, and is the machine which was selected by the Indian Government and standardised for service with the Indian Army in Mesopotamia, Palestine, etc.

Fig. 1.—X Type Thornycroft Lorry as Used by the Indian Government.

The "J" type, an illustration of which appeared in our issue of December 16, was designed to carry a net load of 4 tons, and has obtained the highest commendation from military users for its durability, efficiency, and freedom from breakdowns. For standard lorry or van work this chassis has a wheel base of 13 ft. 7½ in., but for omnibus and chars-a-banc services, for which this type is eminently suited, a special long wheel base of 14 ft. 4½ in. is arranged for.

Designed for loads not exceeding three tons, the "X" type is of lighter construction. The latest of the heavier models is known as the "Q" type, and while the general characteristics of the design are similar to those in the "J" class, the frame and transmission are of stronger make, in order to deal with the heavier loads for which this model is intended.

Each of the three models is fitted with the same type of engine, viz., the Thornycroft 40-H.P. motor, of which the following are the chief features:—Four cylinders, cast in pairs, 4½ in. bore by 6 in. stroke. The valves are arranged on opposite sides of the cylinder head and are all interchangeable. All valves are readily accessible through the quick casting bayonet-jointed cover, which is a special feature of the Thornycroft engine. The camshafts are driven, by means of single helical cut gears, from the crankshaft. The gear on the inlet camshaft forms the spider for the governor, which is therefore totally enclosed in the crank case.

The magneto, through a third shaft parallel to the crank and camshafts, is driven by a single helical pinion gearing with the exhaust camshaft wheel. The fan and the centrifugal circulating water pump are operated by means of a "V" belt from a pulley mounted upon an extension of the magneto driving shaft.

The circulating water pipes are as large as for thermo-syphon cooling, in this way minimising the resistance against the pump and providing sufficient area to run under temporary and restricted conditions in case of failure of fan and pump belt, etc.

Lubrication is by means of a rotary pump mounted upon the front end of the exhaust camshaft, kept primed by a special self-priming box mounted alongside the pump. The pump forces oil to all bearings on the crank shaft, and lubricates other parts by the splash from bearings and large ends of the connecting rods. The pressure of oil in the pipes is regulated by a relief valve mounted upon the timing gear case, so that the overflow lubricates the gearing.

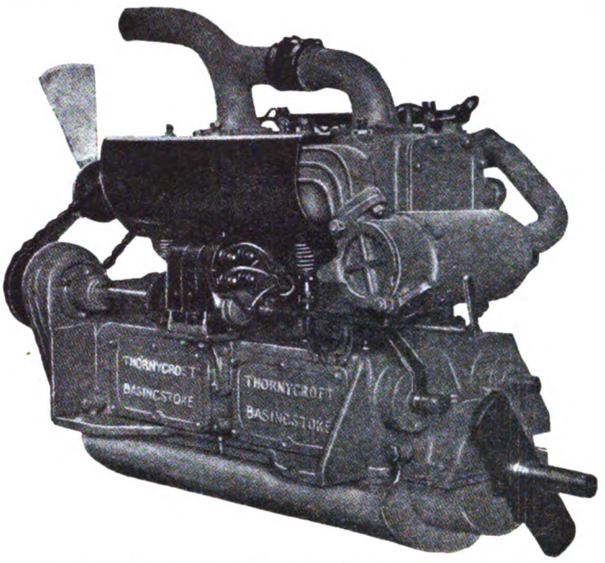

Fig. 2.—Thornycroft Four-Cylinder 40-H.P. Engine.

In our illustration the engine is shown fitted with the Thornycroft kerosene vaporiser (Fig. 2). Although intended chiefly for use on colonial models, this vaporiser has given most satisfactory results on each of the three heavy-type machines to which it has been fitted in considerable numbers.

Messrs. Thornycroft's works at Basingstoke are admirably suited for the construction of motor vehicles in large quantities. The

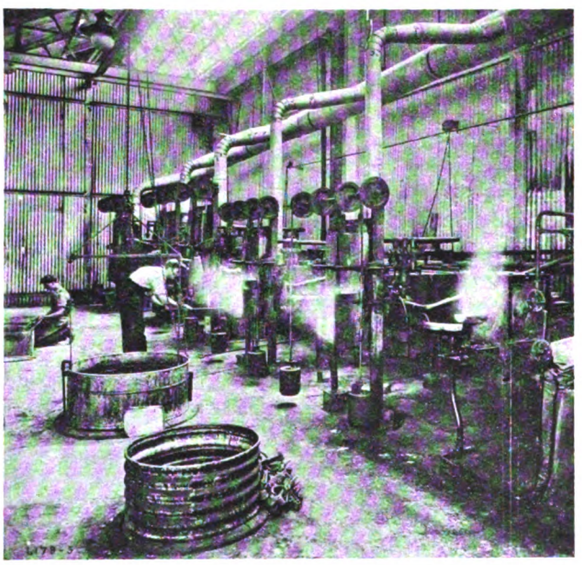

Fig. 3.—The Case-hardening Plant.

system upon which the resources have been developed during the war, in order to meet the great demands of the Government departments, has so perfected the progressive stages of construction that the works have become one of the most important industrial motor factories in this country. The organisation for the reception of visitors had been so perfected that the party were able, during their tour of the works, to trace the progressive stages of manufacture

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from the time of the entry of raw material into the works until the final testing of the completed chassis.

A noteworthy feature was the varied stocks of raw material, which are carefully graded and stored in proximity to the workshops. It is this careful selection, in conjunction with the special processes of treatment in the course of manufacture, that plays such an important part in the life of the modern motor vehicle. As indicating the changes that have taken place during recent years on

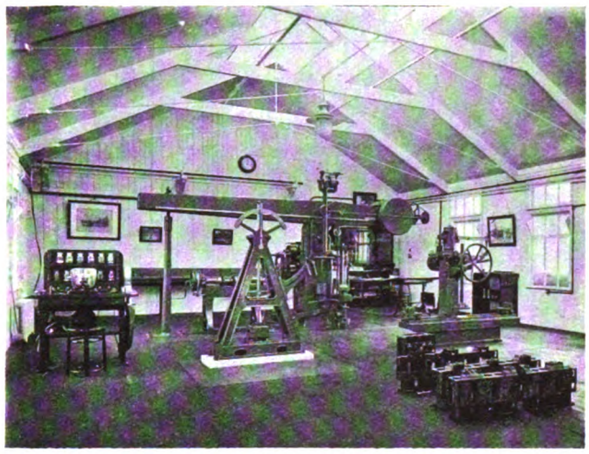

Fig. 4.—View of Laboratory showing Mechanical Testing Machines.

this question of selection of material, Sir John Thornycroft, who personally conducted the party of visitors, remarked that at one period steel was steel, but to-day there was a special grade of steel for practically every component part of a machine.

In the timber store, which has a capacity for some £80,000 of wood, natural drying has been arranged for, but owing to the present difficulty of obtaining a sufficient quantity to allow for this, the company are installing apparatus for artificial drying Throughout the works the visitors were much impressed with the cleanliness and spaciousness of each of the departments. All the floors are of concrete. Even in the smithy the atmosphere was perfectly clear, and the shops well lit. Each hearth is connected to a system of exhaust pipes, which remove all smoke and fumes. Complete installations for electric welding, acetylene welding, and die casting are also housed in the smithy. The latter operation was watched

Fig. 5.—The Laboratory showing Chemical Testing Appliances.

with interest by the visitors, finished white metal bearings being produced without machining.

A well-equipped case-hardening shop (Fig. 3) is run on producer gas, the gas plant being fed entirely by waste from the body-building shop, together with the sawdust and waste wood from the saw mills. Coming to the engine shop, in addition to a large number of the standard 40-H.P. vehicle motors, the visitors were shown a number of coastal motor-boat engines, for which Messrs. Thornycroft have earned a world-wide reputation.

In the erecting shop some 80 chasses in various stages of completion were seen. The visitors were here given an excellent opportunity of examining in detail each component part, the method of assembly together, and the accuracy of adjustment. Messrs. Thornycroft have their own body-building shops and are, therefore, able to supply complete vehicles built to any requirements. This shop is equipped with the latest wood-working machinery. Entering the paint shop, a number of finished vehicles were shown, some striking examples of colour combination being seen.

Remembering that the reduction of dead weight in vehicles is of primary importance, it follows that accurate knowledge of the nature and strength of the material used in construction is essential. In order to obtain this in the fullest sense, Messrs. Thornycroft have an exceptionally well-equipped laboratory, views of which are reproduced in Figs. 4 and 5. Here chemical and mechanical tests are carried out in a manner that ensures the use of only the most suitable material. In planning the Basingstoke works Messrs. Thornycroft have paid every attention to the comfort and convenience of the staff. The offices are large and airy, while the commodious mess rooms with their up-to-date cookery appliances are all that could be desired.

The visitors were given an opportunity of taking part in a hill climbing test by a number of the "X" type vehicles destined for the India Government. This was carried out on the long ascent of Farley Hill, where the gradient at one place is 1 in 7. The vehicles ascended the hill in good style, and on the return gave a remarkable exhibition of the efficiency of the brakes.

An item of added interest to the visit to Basingstoke was a demonstration of the Thornycroft trench mortars and depth charge thrower, which had been arranged in Hackwood Park, adjacent to the town. This particular type of gun was designed and manufactured by Messrs. Thornycroft, and large numbers have been supplied to the Army and Navy. It is understood that the success of the submarine chasers with regard to depth charge dropping can be largely traced to the efficiency of the Thornycroft thrower. Now that the period for the termination of war work has been reached, the well-organised works and highly efficient staff will be able to cope with the daily increasing demand for Thornycroft vehicles.

THE FUTURE OF GAS TRACTION.

In an address on "Gas Traction Development" at Manchester College of Technology, on the occasion of the exhibition of a gas-propelled chassis, Mr. E. S. Shrapnell-Smith, secretary of the Inter-Departmental Committee on Gas Traction, spoke of the disappointment caused by the placing of gas under control. The case for gas traction had not, he said, been inherently prejudiced by the war-time difficulties of 1918. The requirement for gas permits ceased on Friday, January 10, after which date gas could be used for traction purposes by anybody who could obtain it. In years to come it would be necessary to secure the utmost production of every class of motor fuel, as there was a limit to the world's output of petrol, but not to users' requirements. The portents were in favour of the continued and extended use of gas, on a competitive basis in the first place, and, by degrees, on the ground of equal convenience, no matter what liquid fuels might be offered.

BATTERY VEHICLES IN NEW ZEALAND.

Mr. L. Birks, electrical engineer to the Public Works Department, Christchurch, reports that electric road vehicles have proved their adaptability to various phases of transport, and aroused a strong demand for a more liberal supply of vehicles. In Christchurch alone there are 20 lorries, and a dozen vehicles are on the way out, including several repeat orders.

New Zealand is on the eve of big developments in hydro-electric power supply. "Already," says Mr. Birks, "every farmer in this district is clamouring for a supply of electricity, and battery charging stations will be established in every available situation." The Rongotea Dairy Company estimate that electrics are effecting a saving of £1 10s. per running day as compared with the cost of operating petrol vehicles at the present time.

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DEPARTMENTAL COMMITTEE ON ROAD LOCOMOTIVES AND HEAVY MOTOR VEHICLES.

RECOMMENDATIONS REGARDING CONSTRUCTION AND USE.
A DIFFERENCE WITH SCOTLAND YARD ON OMNIBUS SPECIFICATIONS.

The report of the Departmental Committee appointed by the President of the Board of Trade to consider the Law and Regulations relating to the Construction and Use of Road Locomotives and Heavy Motor Cars was issued in January, together with a voluminous Blue Book containing the evidence taken before the Committee. We now publish an extended summary of the report, which was briefly referred to in our issue of January 16. The Committee, which was appointed in March, 1915, consisted of Messrs. E. Shortt, K.C., M.P., A. G. G. Asher, W.S., P. M. Crosthwaite, M.Inst.C.E., H. H. Humphreys, M.Inst.C.E., E. J. Lovegrove, M.Inst.C.E., J. E. Thornycroft, A.M.Inst.C.E., and J. Willmot, F.S.I. Mr. Shortt acted as chairman, and Mr. R. J. Simpson was the secretary.

The report comprises 35 pages, the volume of evidence, with appendices, 388 pages. Twenty-seven meetings were held and 66 witnesses were examined. A sub-committee appointed to examine evidence, etc., in detail, held eleven meetings. In addition to representatives of Local Government Authorities, witnesses were heard from the Tramways and Light Railways Association, National Traction Engine Owners' and Users' Association, Steam Cultivation Development Association, Society of Motor Manufacturers and Traders, Commercial Motor Users' Association, London General Omnibus Company, British Electric Traction Company, etc. Evidence was also received from certain Government Departments. The views of the Commissioner of Police upon suggestions relating to the construction of motor omnibuses and other matters were put before the Committee by Superintendent Bassom. The Committee invited certain of the railway companies and the Scottish Motor Traction Company to appoint representative witnesses, but the invitation could not be accepted owing to conditions arising out of the war.

In the narrative of the "Course of the Proceedings" the Committee mention that among the demonstrations they witnessed were tests designed to show the surface resistance of different kinds of roads, which tests were arranged and carried out by the London General Omnibus Company, to whom they desire to express indebtedness for their courtesy in providing the demonstrations and tests and for the thoroughness with which they were carried out.

DAMAGE TO ROADS AND CAUSES OF DAMAGE.

In the course of their "General Observations upon the Evidence," the Committee say:—Certain general principles have emerged clearly. In the first place, heavy mechanically-propelled traffic, both for passengers and for goods, has developed very largely in the last few years, will in all probability still further develop, and must be recognised as playing a necessary and an increasing part in the commercial and industrial life of the nation. In the second place, such traffic is to a very considerable extent no longer local in its character, and in framing laws and regulations for its control due regard must be had to the extended nature of its operations. In the third place, it has been made clear (i.) that it is possible to construct and maintain roads capable of carrying the traffic efficiently at a cost which, if equitably adjusted, would not be unreasonable; and (ii.) that as the traffic grows, and becomes less local in its character and more extended in its operations, so it will become more and more necessary to treat the roads which carry such traffic less from the local standpoint and more in accordance with its extended character, with respect both to cost and to control and administration.

It has been shown conclusively that, in a number of districts, damage has been caused to the roads by the traffic in question, and that a number of local authorities have been put to considerable additional and unfair expense. Many suggestions have been made by witnesses who spoke on behalf of county, borough, and district councils, tramways companies, and road authorities generally for mitigating the injury done to the roads. The principal suggestions can be conveniently divided into two classes:—(i.) Those dealing with the weight, construction and speed of the vehicles; and (ii.) those dealing with choice of route, bye-laws, and the general control of the roads and traffic by central and local authorities.

In considering the effect of heavy traffic on the various kinds of road construction, it is necessary to distinguish between the effect of locomotives and heavy motors tired with iron, steel, or other hard material, and the effect of those which are rubber tired, including motor omnibuses, or tired with some other soft or elastic material.

In setting forth the principal causes of alleged damage to roads, the Committee add:—In addition, special damage is attributed to motor omnibus services by reason of (1) the regularity of the service, namely, the constant passage over a road of vehicles of identical construction, and the frequent stopping and starting of the omnibuses, often at fixed points along the road; and (2) the "character of the load" and the springing of the vehicle.

SUMMARY OF RECOMMENDATIONS.

The Committee's summary of their recommendations is as follows:

Road Locomotives: Weight, Construction, and Speed.

(1) The maximum limit of weight of 14 tons should remain unaltered as regards ordinary road locomotives, and should be raised to 18 tons in the case of the Boulton wheel traction engine. The expression "weight" should be more clearly defined.

(2) The licensing authority should be required to ascertain the correct weight of a locomotive by causing the locomotive to be weighed before it is licensed or registered.

(3) Certain amendments should be made in the provisions of Section 28 of the Highways and Locomotives (Amendment) Act, 1878, which prescribe the width of the tires of the wheels of locomotives. A locomotive should be prohibited from carrying a load of goods or merchandise.

(4) The provisions of the same section authorising the use of diagonal crossbars upon the driving wheels of locomotives should be amended by prescribing the angle at which the crossbars should be affixed.

(5) Locomotives should be constructed with springs, except in certain cases.

(6) Existing locomotives should be exempted from compliance with any new requirements as to construction.

(7) The statutory provisions regulating the weights to be carried upon wagons drawn by locomotives should be repealed, and new regulations substituted, based upon those applicable to vehicles drawn by heavy motor cars.

(8) A highway authority should be notified in advance of the passage over a road in its area of a traction engine hauling a wagon which carries a single article exceeding 16 tons in weight.

(9) The speed at which a locomotive is permitted to travel when passing through any city, town, or village should be increased from two miles an hour to three miles an hour.

(10) The powers of the Local Government Board should be extended so as to enable the Board to increase the weight of the Boulton wheel engine, and to permit the use of new and improved types of locomotives.

Heavy Motor Cars: Weight, Construction, and Speed.

(11) The maximum unladen weight of a heavy motor car should be increased to 6 tons, and the combined unladen weight of the car and trailer should be increased to 8 tons.

(12) The definition of the unladen weight of a motor car should be amended.

(13) The maximum laden weight and the maximum axle weight should not be altered.

(14) Before a heavy motor car is registered, it should be weighed by or in the presence of an officer of the registering authority and its correct unladen weight definitely ascertained, and the registering authority should be required to satisfy themselves that the correct weights and speed are marked on the car. The registering authority should be authorised to require a motor car to be weighed, upon an application for registration, if the declared weight of the car unladen does not exceed 2 tons.

(15) The distance which a heavy motor car may be required to be driven to a weighing machine for the purpose of testing the axle weight should be increased to one mile, and registering and road authorities should for this purpose be empowered to require a car to be driven to a weighing machine from any distance beyond the one mile limit, subject to provisions as to the payment of compensation and the delivery of a certificate of weight. Heavier penalties should be imposed in the case of habitual offenders against the regulations limiting axle weight.

(16) The minimum diameter for wheels of heavy motors fitted with iron, steel, or other hard tires should be raised from 2 ft. to 2 ft. 9 in., and a scale of minimum diameters should be prescribed, according to registered axle weight, where the registered axle weight exceeds four tons.

(17) The edges of a tire of iron, steel, or other hard material should be rounded. Bevelled edges should not be permitted.

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In other respects the regulations relating to the use of this description of tire should not be altered.

(18) The diameter of any wheel of a heavy motor, which is fitted with a solid rubber tire or other tire of a soft or elastic material, not being a pneumatic tire, should not be less than 2 ft. 6 in. No regulation need be made as to the size or shape of the tire itself.

(19) The maximum overall length of a heavy motor car should not exceed 26 ft. The overhang behind the driving axle should not exceed seven twenty-fourths of the overall length of the car. These requirements should apply to motor omnibuses.

(20) Heavy motor cars registered and in use before amending regulations come into operation should be exempted from compliance with any new requirements as to construction, and the loads which such cars are at present permitted to carry should not be reduced.

(21) The existing law, which permits a motor car to be used to draw one trailer only, should be retained. Certain minor amendments should be made in the regulations relating to the use of trailers.

(22) The present speed limit regulations should be retained, subject to the following amendments, namely, (*a*) that the speed for a heavy motor car tired with iron, steel, or other hard substance should not in any case exceed five miles an hour, and (*b*) that where a heavy motor car draws a trailer and the wheels of both vehicles are fitted with rubber tires, the maximum speed should be eight miles an hour.

(23) Heavier penalties should be imposed for a second or subsequent offence against the speed limit regulations.

Restriction of Heavy Traffic on Unsuitable Roads.

(24) Motor omnibus and similar passenger traffic should be brought under special regulation, and the procedure should be that laid down in Section 20 of the Local Government (Emergency Provisions) Act, 1916.

(25) Powers should be conferred on the Local Government Board and the road authorities to regulate through heavy motor traffic in order to secure that such traffic is, as far as practicable, required to use the roads which are constructed to carry it.

(26) County Councils should be given power to regulate traffic upon a road which is under repair or reconstruction, and to divert the traffic on to another road.

Special Questions.

(27) The question of legalising the use of self-propelled vehicles constructed on the wheelless pedrail system should be further considered when the opportunity arises.

(28) The law relating to heavy motor cars should not be extended so as to authorise the use thereunder of road trains.

(29) Steps should be taken to deal with the question of requiring heavy motor cars to be provided with lifeguards.

(30) The law need not be amended so as to require drivers of road locomotives to be licensed.

(31) The provisions of the Town Police Clauses Acts, 1847 and 1889, so far as they relate to the licensing of motor omnibuses, should be reconsidered with a view to their revision in certain respects.

(32) The existing provisions with regard to the emission of smoke or visible vapour from locomotives or motor cars should be repealed, and in lieu thereof it should be made an offence to cause or permit the emission of smoke or visible vapour from a locomotive or motor car on a public highway in such quantity as to be a nuisance or danger to the public.

(33) The bye-law requirement as to the provision of means of communication between the rearmost wagon of a train of wagons drawn by a locomotive and the driver of the locomotive should be made a statutory requirement. A heavy motor car should be required to carry a mirror whereby the driver can see overtaking traffic.

(34) The existing law should be amended so as to provide more effective measures for securing the strengthening and improvement of bridges which do not meet the requieements of heavy self-propelled traffic, and to ensure the removal, and prevent the imposition, of unnecessary restrictions upon the use of bridges by such traffic.

(35) The various suggestions relating to the question of extraordinary traffic should be considered in connection with any amendment of the law on this matter.

(36) Public funds should be made available to encourage the design and construction of heavy mechanically-propelled vehicles calculated to cause less damage to the roads and facilities given for trials and demonstrations of self-propelled vehicles which cannot ordinarily be used on the public roads without breach of the law.

(37) The law should also be amended to give effect to certain suggestions of a minor character.

(38) The law should be simplified and consolidated.

The Committee treat each of the foregoing 38 recommendations in detail.

HEAVY CARS—MAXIMUM LADEN WEIGHT AND AXLE WEIGHTS.

There is no evidence, the Committee remark, to show that the road authorities generally consider that the present maximum weights of 12 tons for the total laden weight of the heavy motor car, 8 tons for any axle of the car, and 4 tons for any axle of the trailer, are too high for good class roads. One or two surveyors are disposed to allow some slight increase provided that their suggestions as to wheel construction are carried out, whilst another surveyor favours a considerable increase. The views of manufacturers and users differ; generally their witnesses desire some increase, but one witness considers that no increase is required.

The evidence as to the state of the roads and the damage caused by heavy motor traffic was given before the full effect of war conditions had been experienced. Upon this evidence we should have felt considerable hesitation in recommending any increase of the maximum laden weights. But in view of the deterioration in the surface of a very large mileage of important roads, which has taken place during the last two years and still continues, due, on the one hand, to the great volume of traffic serving military and other national requirements, and, on the other hand, to the inadequate supply of labour, materials, and money required for works of road maintenance, we are very strongly of opinion that no increase in the laden weights should, for the present, be allowed.

It seems to be established beyond question that the carrying of loads in excess of the legal limits is a common occurrence, and there is reason to suppose that the weights declared on registration and marked on the cars are sometimes incorrect. We are satisfied that an appreciable amount of the damage caused to roads may properly be attributed to these practices, and that it is desirable to strengthen the hands of the road authorities, and to emphasise the need for greater accuracy and a more general use of their powers for dealing with overloading. (Recommendations 14 and 15.)

The considerations which render necessary the use of wheels of larger diameter for iron and steel tired motors apply, though with less force, to the rubber-tired vehicle. Several witnesses have suggested that in this case also a minimum diameter should be prescribed, and have mentioned sizes varying from 2½ ft. to 3 ft. We are satisfied that the roads would benefit considerably if the use of wheels of small diameter were prohibited, and we recommend that a new requirement should be imposed to the effect that the diameter of any wheel which is fitted with a tire of a soft or elastic material, other than a pneumatic tire, should be not less than 2 ft. 6 in., inclusive of the tire. As such a requirenent will apply to wheels of vehicles when in actual use, whether the wheels be shod with new or worn tires, it will in practice entail a slightly larger diameter when the tire is new, so as to allow for the reduction in size of the diameter due to the wear of the tire. For the purpose of the requirement, the size of diameter should be ascertained by horizontal measurement. (Recommendation 18.)

Objection is taken to the use of the twin solid-rubber tire on the ground that it does more damage to the road than the single tire. It appears to us that the only special damage which can be attributed to the twin tire is due to some displacement of road material which is forced into the space between the two tires as they expand towards each other—the "pinching" action of the tires—and that this process can only occur on a road the surface of which is not firm enough to withstand the expansion and contraction of the tire. The twin tire secures a larger contact area than could be expected to be obtained by the use of the single tire, given the same axle load. We are disposed to agree with the witness who claimed that the interests of the tire maker are so closely identified with those of the road maker that it can safely be left to the former to produce the best possible tire.

LENGTH, WHEEL BASE, AND OVERHANG.

There is no regulation dealing with any of these matters in the Heavy Motor Car Order. A tendency has grown up to bring the back wheels as far forward as possible in order to obtain a better thrust or drive. This tendency has been condemned on account of the damaging results it has upon the road. It throws an undue proportion of the total laden weight upon the driving axle, and is in part responsible for contraventions of the regulations limiting axle weight which we have referred to. In addition, it increases the swinging motion at the rear of the vehicle, and consequently the force of the impact when the vehicle is passing over an uneven road surface. Consideration of the evidence referred to has convinced us of the need for regulating the position of the driving axle, and we recommend that the following requirements be imposed:—

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(i.) The maximum overall length of a heavy motor car shall not exceed 26 ft.

(ii.) The overhang behind the rear axle (in practice the driving axle) shall not exceed 7/24ths of the overall length of the car. (Recommendation 19.)

We have also considered whether a further requirement ought to be imposed to the effect that the wheel base of a heavy motor car should be of a prescribed minimum length proportionate to the overall length of the vehicle. We are of the opinion that it is more important to regulate the overhang behind the driving axle, as recommended in (ii.) above, and that the adoption of this recommendation would make it unnecessary to lay down any definite rule as to the length of the wheel base.

EXEMPTIONS FROM STRUCTURAL REQUIREMENTS.

We do not consider that it would be reasonable to require that heavy motors, which have been constructed in compliance with the existing regulations, should conform with any amending regulations made to give effect to our suggestions respecting the compulsory use of larger wheels, the length of the vehicle, and the overhang behind the driving axle; neither do we think that the new regulations should have the effect of reducing the loads which such motors would otherwise be permitted to carry. (Recommendation 50.)

WEIGHT AND CONSTRUCTION OF THE LONDON MOTOR OMNIBUS.

Motor omnibuses licensed in the Metropolitan Police Area are required to comply with the conditions laid down by the Commissioner as the licensing authority. These conditions are in many respects more onerous than the restrictions contained in the Heavy Motor Car Order, and deal with matters not covered by that order. Full and detailed evidence was given by Mr. Iden, then chief engineer of the London General Omnibus Company, with regard to these conditions, so far as they bear on the question of road damage, and the measures taken by the company to comply with them.

The chief engineer suggested that an addition of 10 cwts. should be made to the unladen weight of the motor omnibus permitted in the Metropolitan Police Area, namely, 3½ tons. He pointed out that the addition of that 10 cwts. would enable the omnibus to be constructed with a longer wheel base (although still well within the limit allowed by the Metropolitan Police), longer springs, and a deeper tire, the result of which would be to decrease substantially the damage done to roads by the motor omnibus services.

The Metropolitan Police strongly object to any increase of weight on the score of vibration, but it appears to us to be probable that any increase in vibration, which would ordinarily be due to an increase in weight, would be largely counteracted by the structural alterations suggested.

We are very strongly of opinion that these suggestions, if carried out, would be beneficial to the roads. But it appears clear from the evidence that, taken together, they will entail an appreciable addition to the weight of the omnibus, and we have refrained from definitely recommending the adoption of the suggestions in their entirety on the ground that the introduction of a substantially heavier omnibus might tend to increase the number and severity of accidents in the streets. We nevertheless consider that, as regards future construction, the London motor omnibus should be required to conform in the matter of overhang behind the driving axle with the new requirement suggested in paragraph 49, even if the structural alterations thus entailed will involve some increase in the weight of the omnibus.

TRAILERS AND PASSENGER HAULAGE.

It has been suggested that the existing law, which provides that a motor car shall not be used to draw more than one trailer, should be relaxed, so as to enable a motor tractor to be used to draw two trailers. We consider that the existing law should be retained; where more than one trailer is hauled, the motor tractor should be treated in law as a "locomotive." (Recommendation 21.)

Among other suggestions is one that the existing prohibition against the use of trailers behind passenger-carrying heavy motors should be relaxed so as to admit of the use, subject to conditions, of trailers carrying passengers or of trailers carrying luggage. The use of such trailers would, in our opinion, be likely to constitute an additional element of danger upon the public highway, and should not be allowed.

SPEED—REGISTERS AND ENGINE GOVERNORS.

It is clear from the evidence that the speeds at which damage is most frequently caused are speeds which are in excess, and often greatly in excess, of the legal limits. We have received a number of proposals for altering the present limits. There is nevertheless a considerable body of opinion amongst road surveyors in favour of the retention of these limits. The proposals referred to include the following:—

(*a*) Those made by the representatives of Metropolitan Councils, advocating the reduction of the present limit for omnibuses of 12 miles an hour to 10 miles an hour, and as regards other rubber-tired traffic, the reduction of the present limits of 8 and 12 miles an hour to 5 and 8 miles an hour respectively.

(*b*) The proposals made on behalf of users for various speed limits ranging from 6 miles an hour to 20 miles an hour, according to weight, type of tire, and whether or not a trailer is drawn.

(*c*) The proposal of the London General Omnibus Company that the limit for motor omnibuses should be raised to 16 miles an hour. (Evidence of Sir Albert Stanley.)

After a careful consideration of all the evidence, we have come to the conclusion that it would not be desirable to make any drastic alteration of the present regulations. The proposals made on behalf of the Metropolitan Councils, if adopted, would in our view have the effect of seriously increasing the congestion of traffic, and on this ground alone the proposals appear to be inadmissible. Whilst we do not consider that the proposed increase of the speed of the omnibus to 16 miles an hour would have a serious effect upon properly constructed paved roads in the metropolis, it would undoubtedly increase the damage done to other roads, and give rise to complaints of vibration. We are also unable to satisfy ourselves that such an increase of the speed limit would not lead to more serious and more frequent accidents. (Recommendations 22 and 23.)

The other suggestions relate to the compulsory use of mechanical devices designed either—

(*a*) To register the speed of the car; or

(*b*) To notify to persons on the highway that the car is exceeding the speed limit; or

(*c*) To automatically restrict the speed of the car to its legal limit.

These devices appear to be either unreliable in practice or open to some other objection. As regards speed registers, or speed indicators, these would, if effective, help a law-abiding driver to keep within the law, but they would seem to be of little value in the case of a deliberate offender. With regard to appliances for giving audible warning of illegal speed, there is no evidence that an efficient appliance exists, and witnesses differ as to the advisability of using such appliances, some contending that these would prove to be a public nuisance. The third class includes engine governors arranged so as to limit the speed to a fixed maximum. The evidence as to the practicability or otherwise of some compulsory mechanical limitation of speed does not seem to be conclusive. It would not appear to be essential that the mechanical limitation should come into operation at the legal maximum speed; some margin might be allowed to enable the vehicle to slightly exceed the legal maximum in order to avoid accidents and to maintain a reasonable speed when ascending a hill or in other unfavourable conditions. If it can be shown that some suitable arrangement for mechanically limiting the speed is practicable, it would seem that the circumstances would warrant its compulsory adoption, but there is no evidence which would justify us in reporting that any such arrangement exists.

RESTRICTION OF HEAVY TRAFFIC ON UNSUITABLE ROADS.

The need for some measure of control over heavy motor traffic, particularly omnibus traffic, which would enable the road authorities to safeguard roads unfitted for such traffic, has been very strongly urged. Witnesses for the road authorities differ as to the form which such control should take. One suggestion is that notice should be given to the road authority of any proposal to establish a service of heavy motors, and that the road authority should be empowered to prohibit the service subject to an appeal to the central authority. A further suggestion commonly put forward is that road authorities should be authorised to prescribe the routes for motor omnibuses. The general opinion of witnesses for the motor manufacturers and users appears to be that any further restrictions upon heavy motor traffic, aiming at the protection of inferior roads, should be confined to restrictions upon speed. Whilst the London General Omnibus Company are opposed to any system of control which would entitle a road authority to impose conditions or to exact bargains in connection with the establishment of a new route, they appear to be willing that the road authority should be given the right to object to a proposed service, and that the final determination should rest with a central road authority.

It has been represented by witnesses that motor omnibus and similar passenger traffic should not be singled out for special regulation, but it seems to us that a distinction can fairly be drawn somewhat on the following grounds:—

(*a*) Motor omnibuses are already subject to control as public service vehicles under the Acts requiring omnibuses plying for hire to be licensed; trade motor vehicles are not subject to similar control. (*b*) Motor omnibuses plying for hire normally follow a defined route, and the use of roads generally is not essential to their requirements. On the other hand, trade motor vehicles require the use

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of all classes of roads. (*c*) Motor omnibus traffic is in a greater degree than trade heavy motors the cause of the sudden damage to roads which it is desired to prevent. (*d*) A motor omnibus service, by reason of the regularity of the service, the more or less continuous passage over the road of a number of vehicles of identical construction, the numerous stoppings and startings, and certain characteristics of the vehicles, does special damage.

We think that the evidence which has been given as to the serious damage caused to a number of roads by motor omnibus traffic, and the very heavy expenditure entailed in improving those roads to render them fit for the traffic, goes far to prove that omnibus traffic is exceptional in character, presents special difficulties to highway authorities, and requires special treatment. We are of opinion that much of the damage and expenditure might be avoided if there existed between the omnibus companies and the highway authorities, both local and central, the closer co-operation which may be expected to result from placing omnibus traffic under control. With closer co-operation it should often be found possible to abstain from using a road which is known to be unfitted for the traffic, or if such a road must be used, to carry out the necessary works of improvement before the service has commenced, and consequently under more favourable conditions and at less cost.

We accordingly recommend that motor omnibus and similar passenger traffic be brought under special regulation, and that the procedure be that laid down in Section 20 of the Local Government (Emergency Provisions) Act, 1916, namely, existing omnibus routes to be left untouched, and new routes to be established with the consent of the highway authority, or, if that consent is refused, or is given subject to unreasonable conditions, with the consent of the Local Government Board. (Recommendation 24.) In recommending that this enactment be made permanent, so far as it relates to omnibuses, we desire to make it clear that we have not thought it necessary to consider this enactment in connection with any questions relating to contributions by omnibus traffic towards road maintenance, since we have understood that these questions are to be dealt with by another committee.

The second case of unreasonable use of roads to which we referred can, we think, be largely met by a scheme regulating through heavy motor traffic. (Recommendation 25.)

ROAD TRAINS—LIFEGUARDS—SPLASHGUARDS.

From the point of view of road damage, the use of a road train constructed in accordance with the Thomas transmission system appears to us to be sound in principle, since the driving effort, which in the case of an ordinary self-propelled vehicle drawing one or more trailers is concentrated on two driving wheels, is under this system distributed over a series of driving wheels. The proposal is to allow the use on the roads of trains constructed on this principle made up of three, four, or five vehicles, having a maximum moving weight of 42, 56, and 70 tons respectively, and permitted to travel at maximum speeds of 12, 11, and 10 miles an hour. The proposal represents a very great advance upon anything that has hitherto been permitted. It appears to us to be very doubtful whether road trains, such as suggested, could properly be allowed on roads generally, and after carefully considering the matter we are not prepared to recommend that their use should be legalised. (Recommendation 28.)

No progress appears to have been made towards the solution of the problem of the front guard. The side guard of the "inswept hurdle" type, the use of which on London motor omnibuses is now, under police regulations, compulsory, appears to be satisfactory; and the only question is whether that type of side guard can be extended to heavy motor cars generally or to some recognised classes of heavy motor cars. The London motor omnibuses being practically uniform in construction, can carry side guards of a uniform type; but the question is much more complicated when considered from the point of view of the great diversity in the construction of heavy motors generally. We recognise the difficulties of dealing satisfactorily with this problem, and we recommend that steps should be taken to overcome those difficulties, and to secure that heavy motor cars are provided with suitable and sufficient lifeguards. (Recommendation 29.)

Complaints have been made to us as to the serious nuisance arising from mud-splashing. It appears to be desirable that, at any rate in the case of heavy motors permitted to travel at the higher speeds, the use of splashguards should be compulsory as soon as an efficient splashguard is available. Investigations and experiments have been conducted by the users and the Metropolitan Police with regard to several types of splashguard, but have not resulted in the discovery of one likely to prove sufficiently suitable to justify its general adoption.

LICENSING OF MOTOR OMNIBUSES.

Motor omnibuses plying for hire are required to conform not only with the law and regulations applicable to them as "motor cars," but also with the statutory provisions, regulations, or by-laws applicable to them as "stage carriages" or "omnibuses," and in force in the area or areas in which they ply for hire. As regards the metropolis, no objection appears to be taken by any witness to the present system under which the power of licensing motor omnibuses and their drivers is exercised by the police.

It is suggested on behalf of the County Councils that those Councils should be the licensing authorities either for the rural areas in the administrative county or for the whole of the administrative county The London General Omnibus Company also favour the transfer of the powers to the County Councils, though they desire to limit the powers of the licensing authority to the mere granting of the licence, subject to an appeal to the Local Government Board in case of refusal, and suggest that the conditions and regulations governing the issue of licences should be uniform throughout the provinces, and should be framed by the Local Government Board. The company complain that under the existing system the licensing authorities make improper use of their powers to impose arbitrary conditions or exact bargains, amounting in some cases to virtual prohibition of omnibus services and rendering through services impossible.

The provisions which govern the licensing and regulation of motor omnibuses in the provinces were enacted to meet the case of horse-drawn omnibuses, whose operations would ordinarily be limited to a particular town and its vicinity, and it is hardly surprising to find that they do not work well when applied to a long-distance motor omnibus service linking up several towns, each of which may be a separate licensing area. We are of opinion that these provisions, so far as they apply to motor omnibuses, motor coaches, and motor chars-a-bancs, require reconsideration in the light of modern requirements, and that attention should be given to the following points:—

(i.) The need for a more uniform system of licensing, which would make it unlawful for motor omnibuses to ply for hire anywhere in the provinces unless a licence has been obtained.

(ii.) The need for a wider local unit of administration, corresponding with the wider radius of action of the motor omnibus.

(iii.) The question of giving a right of appeal to the Local Government Board against a refusal of the licensing authority to grant a licence. This question has a direct bearing upon our recommendations with regard to the regulation of motor omnibus traffic. If, upon an appeal to them under Section 20 of the Local Government (Emergency Provisions) Act, 1916, the Local Government Board have consented to the establishment of a motor omnibus service, it seems to us clearly undesirable that the licensing authority should still be able to prohibit the service by withholding its licence. (Recommendation 31.)

BRIDGES.

Attention is drawn in the evidence to the serious handicap to heavy traffic resulting from the presence on public roads of railway, canal, and other privately-owned bridges, which are not of sufficient strength to carry such traffic, and to the failure of the existing law to provide effective measures for securing that these bridges are strengthened to meet the requirements of the traffic. The need for amendment of the law is rendered more urgent by the recent decisions of the House of Lords in the case of Sharpness New Docks and Gloucester and Birmingham Navigation Company *v.* Attorney-General and Attorney-General (in the relation of Pickfords, Limited) *v.* the Great Northern Railway Company, the general effect of which is that the standard of maintenance of a particular bridge is determined by the conditions prevailing at the time the bridge was originally built, and that the railway or canal company are under no obligation to increase the strength of the bridge to enable it to carry the heavier traffic due to the growth and development of road transport.

We are of opinion that the public demand for improved facilities for road transport requires that the Local Government Board, and, in the case of railway bridges, the Board of Trade, should have more direct control than is given by the present law and regulations, so as to secure that heavy motor traffic is not hampered by restrictions on the use of bridges, which are not in fact necessary. We also think it desirable that the provisions affecting locomotives and those affecting heavy motors should be more uniform in character. We consider that the law and the regulations should be amended so as to provide—

(i.) That in future no restrictions should be placed upon the use of a bridge on a public highway except by by-law made by the Council of the county or borough in whose area the bridge is situate, and confirmed by the Local Government Board.

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(ii.) That if the local authority refuses to make a by-law in respect of a bridge which the local authority is not liable to repair, the person liable to repair the bridge should be given a right to appeal against such refusal to the Local Government Board.

(iii.) That a heavy motor owner should have the right to appeal to the Local Government Board, or to the Board of Trade in the case of a railway bridge, against any by-law made under Section 1 of the Act of 1896, or any prohibition imposed under the Heavy Motor Regulations.

(iv.) That where any restriction is placed on the use of a bridge by a locomotive or by a heavy motor car, whether by by-law or otherwise, the by-law-making authority or the person liable for the repair of the bridge should be required to exhibit on the bridge and at suitable places such as road junctions, on the roadways leading to the bridge, notices indicating the restriction imposed. (Recommendation 34.)

The above suggestions, so far as they relate to heavy motor cars, follow substantially the recommendations made by the Royal Commission on Motor Cars.

EXTRAORDINARY TRAFFIC.

The question of extraordinary expenses due to damage caused by excessive weight or extraordinary traffic has been discussed before us at considerable length, and various suggestions have been made for amending the law and procedure relating to this question. The object of the extraordinary traffic provisions is not to prohibit the traffic, but to put upon the individual responsible for it the extra cost which the traffic occasions.

After expressing disagreement with various suggestions put before them, the Committee proceed :—Other suggestions, made with the view of meeting some of the difficulties arising out of the extraordinary traffic provisions, are :—

(*a*) That before traffic which is recognised by both parties as extraordinary commences there should be an agreement between the parties for strengthening the road to carry the traffic and for apportioning the cost, and, failing agreement, some independent authority should settle the terms. This proposal appears to have been generally accepted by the users.

(*b*) That the road authority should be empowered to apply to the court to appoint a person to inspect the road before the traffic which the road authority considers may be extraordinary commences, during its continuance, and after it has ceased, and to report on the condition of the road.

These suggestions appear to us to be valuable. If the law does not enable voluntary agreements of the kind suggested to be made and enforced, it should, we think, be amended. We further recommend that the proposal contained in (*b*) should be carried into effect, with the addition that the user also should be empowered to apply to the court. (Recommendation 35.)

ASSISTANCE FOR EXPERIMENTAL WORK.

It appears to us to be very desirable that public funds should be made available to encourage the design and construction of mechanically-propelled vehicles calculated to cause less damage to the roads than some of the types at present in use. Facilities should also be given, by special licence or otherwise, to enable trials and demonstrations to be held of self-propelled vehicles which cannot be used on the roads without breach of the law. (Recommendation 36.)

Among suggestions which do not, the Committee consider, necessitate any change in the present law or regulations, was one that the haulage by traction engines of exceptionally heavy loads should take place at night or at times arranged with the highway or tramway authorities.

The existing law is contained in a number of Acts of Parliament passed at different times and in different circumstances, and the Committee are of opinion that the law should be simplified and that the various enactments should be re-enacted with the necessary amendments in a consolidated form.

The Committee consider that the law in force in England and Scotland should, as far as possible, be assimilated. Their recommendations with regard to such matters as the control of motor omnibus traffic and the regulation of through heavy motor traffic, and with regard to questions affecting bridges, apply to Scotland.

OMNIBUSES FOR LIVERPOOL.

The Associated Equipment Company, Limited, have acquire the contract for Liverpool Corporation's fleet of single-deck omnibuses. This firm, who are sole builders to the London General Omnibus Company, Limited, with their expert knowledge of omnibus and commercial lorry construction, should feel assured of brisk business in the future. Many other Corporations are negotiating with them for omnibuses and chars-a-banc.

GOVERNMENT'S MOTOR DEPOT.

STATEMENT IN DEFENCE OF ITS NEW PURPOSE.

The advocates of the huge motor depot scheme which is being constructed by the War Office at Cippenham, near Slough, have generally been disinclined apparently to make a defence of either the old or the new purpose to which this huge expenditure is to be put. Some time ago, however, a "special correspondent" of the *Daily Chronicle* published a statement which is of considerable interest, although its author makes no reply to the criticism of the project contained in the reports of the Select Committee on National Expenditure published in our issue of December 19. Nor does the writer give an explanation of the committee's revelation that the estimated expenditure has increased from a sum slightly exceeding £1,000,000 to £1,750,000.

Our contemporary's correspondent is also silent concerning the following important points :—(1) The apparent subterfuge of the War Office statement in the House of Commons that the erection of the depot was rendered necessary owing to the Germans having possession of several large depots in the territory which they overran in March last ; (2) the offer of motor firms to undertake the repair of a large number of vehicles at a quarter of the cost of the Government scheme ; (3) the suggestion of the Select Committee that in view of the early termination of the war the Ministry of Munitions should release some of their premises for the storage and repair of vehicles.

The writer does not increase our admiration of War Office or mechanical transport administration by taking the reader to the top of the grand stand at Kempton Park Racecourse to view "the long lines of motor lorries standing up to the axle in mud, and stretching far away to the horizon ;" machines "for which you have paid something like £800 each." Then there are "interminable lines of rusty motor bicycles almost buried in weeds, masses of sidecars, great steam tractors, pathetic little cars, Red Cross ambulances, and always and everywhere you are moving in the midst of lorries."

GROWTH OF ARMY MOTOR TRANSPORT.

The article proceeds :—"For the most part they are unwounded to the eye and are dying only of exposure to the weather. Now before you grow angry with the Government for this monstrous neglect of your property, consider these facts :—

"We started the war with 40 lorries ; we possess now something like 50,000.

"The total number of our vehicles in motor transport was 80 ; it is now about 170,000.

"The staff was 14 ; it is now 2,341.

"The number of vouchers issued in 1914 was about 200 ; during the last six months this number was 127,000.

"The area occupied was 3,500 square ft. ; it is now 650,000 square ft.

"Every six weeks we 'turn over' 200,000 tires.

"So vastly has this department grown that at one time there were eight miles of London streets occupied by its vehicles, for which no housing could be found. The young officers who built up this department have grown old and grey in the four years ; they have lived, some of them, on the edge of nervous collapse, and yet have worked from dawn to midnight, wrestling with difficulties enough to kill any ten men.

LACK OF 'SCIENTIFIC CO-ORDINATION.'

"The whole thing has been done from hand to mouth. You go into a backyard in Holborn, and see great crates of spare parts standing under roofs which are labelled Salonica, Basra, Palestine. You go into the banquet hall of a city restaurant and find it filled with clerks typing vouchers and documents that will go to the ends of the earth. You go into a brewery and you are shown 29,000 magnetos at £10 each in a cellar, a safe which contains platinum worth £12,000, and a room of spare parts and tools, the whole stock of which is worth a quarter of a million.

"The brilliant men who have so triumphantly organised the motor transport of the British Armies have never been under one roof, have never been provided with any help in the shape of scientific co-ordination. They have had to do the best they can with any old building, and with their various departments scattered all over London, and with no place for the stabling of their vehicles."

HOW TO AVERT A LOSS AT SLOUGH.

An excellent suggestion has been made by Mr. C. W. Brett, managing director and general manager of Barimar, Limited, for converting the Slough site to a more useful purpose. After observing that it is time Mr. Lloyd George "looked into the Slough adventure," Mr. Brett states :—

"Of the 12,000 to 14,000 British engineering shops now existing there are at least 5,000 to 6,000 adequately equipped for work such as is contemplated at Slough, and as, moreover, these are ready to

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proceed now they could probably complete all the repair work at present required long before the Slough depot is in actual operation. This procedure would have the double advantage of finding work and wages for engineers who have handsomely contributed towards the successful results of the war, and cut out a wasteful scheme which the termination of the war renders quite unnecessary. Moreover, definite action, if taken now, will entail no loss. The Slough site would afford the Premier an opportunity to begin at once the great housing scheme he has outlined. Situate within a few minutes' ride of the Metropolis the position is ideal in character for a garden city, and not a penny of the money so far spent need be wasted."

L.C.C. AND MOTOR OMNIBUSES.

SERVICES TO PRECEDE TRAMWAY CONSTRUCTION AND TO LINK UP DEAD ENDS.

The Highways Committee of the London County Council will submit the following report at a meeting of the Council to be held on February 18:—

London County Council Tramways Auxiliary Omnibus Services.

(1) We are advised that facilities will be afforded for the introduction at a later date than usual of Private Bills in the session of Parliament of 1919.

Owing to war conditions, tramway development has been in abeyance for more than four years; and it will be useful therefore to recall the fact that before the commencement of the war we decided to depart from the previous practice of presenting an annual list of detached proposals for tramway development. Our list of proposals considered by the Council on November 10, 1914, formed part of a comprehensive scheme for tramway consolidation. Only one of these proposals could be submitted to Parliament, as the Council decided, on the date referred to, not to proceed during the session of 1915 with any schemes to which consent of the road authorities concerned could not be obtained. We shall shortly submit to the Council certain of the proposals of greatest urgency with a view to powers being sought in the session of 1919.

It is anticipated that there may be some delay in carrying out the scheme for tramways consolidation, owing to financial and economic considerations and the uncertainty inseparable from proposals requiring the consent of road authorities in London.

With due regard therefore to the limitations which must be expected on tramway development and extension, and the urgent need for greater facilities for passengers on the tramways systems, we have given careful consideration to the question whether the Council should seek Parliamentary power to run auxiliary omnibus services in connection with the tramways undertaking; and we are of opinion that such a power should be sought for specific purposes, e.g., linking up tramways dead ends, including necessary overlaps to traffic points, and providing auxiliary services in connection with housing schemes and proposals for tramway extension.

It is the exception, and not the rule, for a large tramway undertaking to be without the means of utilising omnibuses for auxiliary and experimental purposes, as the larger municipal tramway authorities in the country have powers to run omnibuses, and are thus in a position to utilise them fully in connection with tramways. We are advised that the experience of these authorities confirms our view as to the utility of omnibuses for auxiliary and experimental purposes in connection with tramways.

The Select Committee on Motor Traffic appointed to inquire into the circumstances which had led to the large and increasing number of fatal accidents in the metropolis due to motor omnibuses and other forms of power-driven vehicles, and to make recommendations as to the measures to be taken to secure greater safety in the streets, reported (1913):—

> "A proposal that the London County Council should have power to run omnibuses in order to link up its tramways was mentioned by several witnesses, but was not put forward on behalf of that body. The scheme would require Parliamentary sanction, and your committee are of opinion that, if applied for, permission should be granted. The number of municipalities with such powers has increased, and several years ago included Glasgow, Bristol, Manchester, Leeds, Nottingham, Wolverhampton, Willesden, and other towns. When mentioned to one of the police witnesses, the suggestion was acquiesced in as a very good plan.

POST-WAR COST OF TRAMWAY CONSTRUCTION.

The successful operation of the London County Council Tramways will be prejudiced unless the Council is able, by means of the omnibus, to make a start with traffic services which, but for the war, might have been made by tramway extension. For example, there has already been considerable delay in the linking up of dead ends by means of tramways extension, and the war has been responsible for a new financial consideration, viz., the increased cost of tramway construction. The provision and working of omnibuses by the tramway authority is the practical way of meeting the requirements of the public with the least possible delay.

The provision of omnibuses on trial routes is also a necessity for the Council's tramways undertaking in connection with districts which are being newly developed. Until the development of such districts reaches the stage at which tramway facilities would be practicable, omnibuses could be utilised for the purpose of connecting the districts with the tramway system, with the advantages, in some cases, of allowing the ultimate tramway route to be determined, where there is a choice, as a result of omnibus experiment. For the preliminary route to be determined, where there is a choice as a result of omnibus services auxiliary to the tramways system, should be of great public utility in the early stages of development of suburban areas for housing purposes; and unless adequate services can be provided by the Council, pending the construction of tramways, the work of the Council in pursuance of its housing policy may be seriously affected.

Although during the period of the war every possible step has been taken in connection with the tramways undertaking to keep down working costs and to reap the fullest advantage obtainable from efficient management, it has nevertheless been necessary to place on passengers a heavier financial burden. There is no immediate prospect of any considerable relief from the extra burden placed on the travelling public during the prevalence of war conditions, and it would be inequitable therefore to throw directly on the undertaking, and indirectly on the travelling public, the additional financial burden which would result from tramway construction of a temporarily unremunerative character.

SERVICES TO TRAFFIC POINTS AND BUILDING AREAS.

We consider that it would be undesirable for the operation of omnibuses by the Council to be limited strictly to the area of the County of London, as the traffic problems of Greater London call for treatment on a less rigid principle than that determining, under existing legislation, the sphere of operations of particular tramway authorities. On the other hand, we do not propose that the power to run omnibuses outside the county should extend beyond the reasonable requirements of the public using the Council's tramways undertaking. We think therefore that the Council should be empowered to operate omnibuses beyond the boundary of the County of London to traffic points and to newly developing districts and housing areas.

The solicitor has reported to us, in accordance with standing order No. 175 (4), that the Council has power to promote this legislation, and he advises that the Council should proceed under the provisions of the Borough Funds Act, 1872, as applied by the County Councils (Bills in Parliament) Act, 1903. Ten clear days' notice will therefore have to be given by public advertisement that the question of promoting legislation will be considered by the Council at a meeting to be held on a specified date, which we suggest should be February 18, 1919. It will then be necessary for the Council, should it desire to proceed with the proposal, to pass a resolution to promote the legislation and to defray the costs of so doing out of the county fund. Such resolution must be passed by an absolute majority of the whole number of the Council, and subsequently the Council will have to pass confirming resolutions and will also have to obtain the approval of the Local Government Board to the course of action proposed to be taken.

We have communicated particulars of our proposal to the Finance Committee and the Parliamentary Committee, whose reports will, we understand, probably be submitted to the Council on February 18, 1919. We recommend:—

(a) That the operation of Standing Order No. 192 be suspended in order that the following recommendations (b) may be dealt with.

(b) That notice be given by public advertisement of the intention of the Council to consider at its meeting on February 18, 1919, a proposal that it shall take the necessary measures for promoting in the session of Parliament of 1919 legislations to enable the Council to own omnibuses, and to run, in and in the vicinity of the County of London, auxiliary omnibuses services, for the linking up of tramway dead ends and for other specific purposes; and to defray out of the county fund the cost and expenses of so doing.

G. H. HUME, Chairman.

The report of the Finance Committee under standing orders was to the following effect:—"The Finance Committee have not yet received sufficient particulars to enable them to report upon the financial bearings of the proposal, but they hope to be in a position to report when the matter is considered on February 18."

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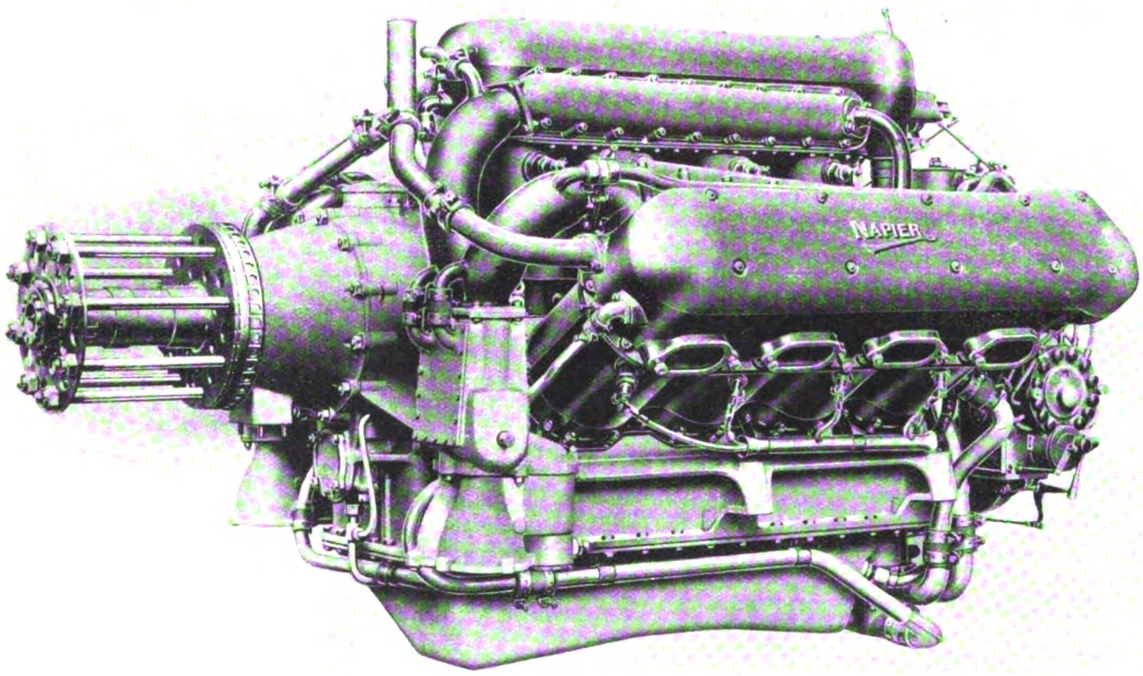
450-H.P. NAPIER "LION" AERO ENGINE.

With the conclusion of peace in sight, British motor engine manufacturers are permitted to reveal something of their productions for the aerial service. A work of great interest is the 450-H.P. Napier "Lion" aero engine made by Messrs. D. Napier and Son, Limited, and shown in the appended illustration.

The general arrangement of the engine is easily seen from the photograph, but the latter does not give an accurate idea of the small size of the actual engine, a factor which assists very materially the aeroplane builder in designing his structures with minimum head resistance. The engine is light, the weight coming out at 1·85 lb. per B.H.P. at normal power. The petrol consumption and oil consumption figures are very good. The engine although so light in weight maintains the Napier reputation for reliability in an extremely satisfactory manner. The Napier tradition of performance is well carried on, a machine fitted with one of these engines having broken records for performance.

to prevent any possibility of the machine catching fire due to engine trouble. There being three separate intakes prevents any possibility of a back-fire in one cylinder stopping the whole engine, as in such case, if one block back-fires, the other two blocks will keep ths engine running and suck in the flames. More attention has been paid to the heating of the carburettors than is usually the case, and water jackets are carried right down and round the throttle barrels themselves to prevent them freezing at high altitude. This is very necessary, as a temperature as low as 35 deg. Cent. was recorded during the test of one of these engines. All moving parts are so completely enclosed that it is difficult to tell by looking at the engine whether it is running. The usual accessories are fitted, and provision is made for starting, speedometer drive, etc. Lubrication is entirely automatic, and very complete arrangements are made to prevent over-lubrication when the machine to which the engine is fitted is dived or climbed steeply for a long time, a point perhaps more important on a fighting machine than in a commercial aeroplane.



Napier 450-H.P. 12-Cylinder Aero Engine.

There are 12 cylinders, 5½ in. bore, arranged in three blocks. The crank shaft is a 4-throw shaft carried on roller bearings, and three pistons are connected with each crankpin. There is a master rod for the centre block and links for the two side ones. Due to the general principle of the design adopted, the engine, although light in weight, is extremely stiff due to its compactness, and runs extremely sweetly. The reliability of the engine follows partly from the smoothness of running, and largely due to the design permitting individual parts being made quite robust, with a very low total weight of the engine.

A reduction gear is fitted and this runs very sweetly, owing to the stiffness of the crank shaft. The gearing is arranged with the air-screw shaft over the crank shaft to permit the largest possible diameter propellor being fitted, so that the greatest possible efficiency can be obtained, and the power of the engine fully utilised. In fact, the engine has been built with a view to suit the special conditions of aeroplane work, bearing in mind that in this particular branch of engineering efficiency pays to an even greater extent than in any other form of handiwork. The cylinders are made from steel forgings and have steel jackets. The head is of aluminium and carries the camshafts which act directly on the valve heads. There are four valves to each cylinder, two inlets and two exhausts. The carburettors are arranged low down at one end of the engine, with separate air intake pipes, this arrangement being adopted

DISPOSAL OF ARMY MOTORS.

Major-General Sir C. R. Crofton Atkins has been appointed to the new Ministry of Supply, and during the last week in January was busy in the task of organising a motor sales department, through which surplus Government motor vehicles are to be disposed of. The new chief was formerly director of transport and supply at the War Office. His first task in his new appointment was to co-ordinate the departments at the War Office, Surplus Government Property Disposal Board, and Mechanical Transport Directorate, which have been dealing with the inspection and sale.

The suggestion has been made that the surplus and disabled motor vehicles should be disposed of by a committee of Government and trade representatives, and that spare parts should be sold to the makers and not in competition with them.

Sir James Stevenson, chairman of the Co-ordination Committee dealing with the demobilisation of munitions, has stated that the Government will have something like £30,000,000 worth of motor vehicles to sell, and that the commercial ones alone represent about three years' pre-war output of the British factories. Sir James has insisted upon the need for the Government carrying the trade with it in the steps taken to dispose of the machines.

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MOTOR VEHICLES FOR MUNICIPALITIES.

HEYWOOD COUNCIL propose to borrow £3,000 for the purchase of a motor fire engine, etc.

STRETFORD URBAN COUNCIL are considering the desirability of purchasing additional motor wagons.

ABERDEEN CORPORATION are purchasing two 4-ton Leyland motors for the street cleansing department.

LEEDS CITY COUNCIL have ordered a 3-ton steam wagon from the Yorkshire Commercial Motor Company, at £1,025.

BOLTON CORPORATION have purchased steam wagons for haulage work in connection with the construction of a reservoir.

BATH SURVEYING COMMITTEE have asked the surveyor to report on the subject of street watering by means of mechanical power.

MANCHESTER CITY COUNCIL have placed an order with Messrs. Drake & Gorham, Limited, for a 3½-ton electric tipping wagon.

EASTBOURNE CORPORATION have received amended prices and specifications from Leyland Motors, Ltd., for the supply of a number of new omnibuses.

HALIFAX COUNCIL have accepted the Electrical Chloride Storage Company's tender for supplying new batteries for an electric vehicle for the sum of £249.

DERBYSHIRE COUNTY COUNCIL have been recommended by their Highways Committee to purchase additional motor wagons, etc., at an estimated cost of £10,000.

LOWESTOFT COUNCIL have received the sanction of the Local Government Board to borrow £1,136 for the purchase of a steam wagon. The loan will be repayable over a period of ten years.

CALCUTTA MUNICIPAL COUNCIL have appointed a sub-committee for the purpose of determining the most suitable method of refuse collection by means of motor wagons, and what types of vehicle should be purchased. There is a total of 1,200 tons of refuse to be moved per day.

HASLINGDEN TRAMWAYS COMMITTEE have appointed a sub-committee to make inquiries as to the cost of petrol-driven and electrically-propelled road vehicles, with a view to complying with the request of residents in Helmshore to be provided with means of communication with Haslingden.

GILLINGHAM COUNCIL have been informed by Edison Accumulators, Limited, that they are prepared to accept payment for battery dust lorries by instalments, with interest at 1 per cent. above bank rate on unpaid balances. Charging plant has been purchased from the General Electric Company at a cost of £409.

MOTOR TRAFFIC NOTES.

OMNIBUSES FOR STRETFORD.—Stretford Urban Council have decided to seek Parliamentary power to enable them to provide and run motor omnibuses.

REPAIRERS OF COMMER CARS.—Commercial Cars, Limited, Luton, have appointed Commercial Car Hirers, Limited, of 112a, Junction Road, Holloway, N., as official repairers of Commer cars.

MUNICIPAL OMNIBUSES FOR EAST HAM.—The Corporation have decided that the tramways engineer and manager should obtain estimates for the supply of twelve motor omnibuses for submission at a subsequent meeting.

NEW MANUFACTURING FIRM.—The Graham-White Company, Limited, aeroplane manufacturers, are devoting part of their works to the construction of bodies for motor lorries and vans, and the repair of industrial motor vehicles.

DEMAND FOR BRITISH MOTORS IN EUROPE.—There is a great demand for British military motor vehicles in continental countries which are faced by the reconstruction problem. Only a limited number is likely to be available until after the military occupation of Germany has ceased.

L.G.O.C. ABSORBS THE ASSOCIATED OMNIBUS COMPANY.—The shareholders have confirmed the resolutions passed at a meeting held on December 31 last approving the sale of this undertaking to the London General Omnibus Company, and the voluntary liquidation of the Associated Company.

MEMORANDUM ON SLIPPERY ROAD SURFACES.—In a memorandum presented to the London Safety First Council the relative liability of vehicles to slip on various road surfaces is placed as follows:—(1) Natural rock asphalt, (2) tar bound macadam, (3) water-bound macadam, (4) wood pavement, (5) granite sets.

U.S.A. EXPORTS OF MOTOR VEHICLES.—In October last the United States exported 737 industrial motor vehicles, as against 1,359 in the corresponding month of 1917. The countries to which the vehicles were consigned were France (392), Canada (115), Great Britain (42), Cuba (41), Russia (15), and other countries (132).

BOURNEMOUTH CHARS-A-BANC.—The Hackney Carriage Committee of the Bournemouth Corporation have come to the conclusion that the licences for vehicles going outside the borough, and not intended for local traffic in Bournemouth, should be limited to fifty. Licences are being granted to local firms in respect of 43 vehicles.

GREAT WEST ROAD OUT OF LONDON.—Mr. W. T. Wakelam, county engineer, has been instructed by the Middlesex County Council to proceed with the preparation of the plans, specifications, and quantities for the construction of the Great West Road immediately circumstances permit, with a view to the work being carried out by contract.

MOTOR EXHIBITION AND ISLE OF MAN ROAD RACE.—For the first time since 1913 the Society of Motor Manufacturers and Traders have arranged for the holding of an exhibition of private cars at Olympia. It will take place in November next. The Royal A.C. hope to arrange for a road race in the Isle of Man in June or July. The renewal of the road trials will not be witnessed until next year.

FORTY-HOUR WEEK AT THE FORD MOTOR WORKS.—Sir Percival Perry, managing director of the Ford Motor Company (England), Limited, Trafford Park, was presented recently by the employees with an address of congratulation on his knighthood. In reply, he announced a reduction of working hours from 48 a week to 40, and such an alteration of minimum rates as to effect a rise in wages as from January 1.

SCOTTISH MOTOR TRACTION COMPANY.—For the year ended September 30 last this company, which runs omnibus services in the Edinburgh district, announces a dividend on ordinary shares of 7½ per cent., free of tax, for the seventh consecutive year. The available balance was £10,535, after placing £4,000 to reserve (making a total of £22,000). The sum of £3,141 was carried forward, as against £3,308 for the year 1916-17.

MOTORS TO LINK UP TRAMWAYS.—Mr. Arthur Ellis, electrical engineer and tramways manager of Cardiff Corporation, has submitted a report as to tramway extensions and means of transport between the city and the adjoining districts, and the matter is to be brought before the Parliamentary Committee. Mr. Ellis in his report points out that the object in view is the development of the outside districts, probably by motor omnibuses, in order to feed the tramway system.

THE FRENCH WAR IMPORT TAX ON MOTORS.—Mr. Claude Johnson, managing director of Rolls Royce, Limited, is hopeful that in accordance with the French law of May, 1916, the 70 per cent. *ad valorem* tax on all motors imported into France will be rescinded on the signing of peace. Many French constructors, however, are asking for the protection of the tax for at least two years, while others regard eight months as the minimum time in which they can reorganise their factories on a peace basis.

ESSEX OMNIBUS TRAFFIC.—The Highways Committee of Essex County Council recommend granting the application of Mr. C. A. Parker, carrier, of Manningtree, for permission to run a motor omnibus from Manningtree to Colchester, and Manningtree to Ipswich, on the following conditions:—The payment of £1 per annum for the route, payable in advance on January 1 each year, and a contribution of one farthing a mile per omnibus. The rate is subject to revision 12 months hence.

NATIONAL STEAM CAR COMPANY MAY RUN PETROL OMNIBUSES.—Reporting at the annual meeting of the company that as the result of negotiations the directors had made an agreement with the London General Omnibus Company, Mr. Hawksley, the chairman, said it placed the Steam Car Company in a very favourable position as regarded rolling stock and running expenses, and it could, if desirable, obtain and run the identical vehicle in use by the London General Omnibus Company. If the board found that petrol omnibuses were the most profitable in London, they would adopt them.

A TRAMWAY MANAGER ON OMNIBUS TRAFFIC.—In taking leave of Chesterfield Corporation, before his departure for London to manage a motor transport undertaking, Mr. Acland, the tramways manager and electrical engineer, remarked that the motor omnibuses belonging to the Corporation had been self-supporting, but the road problem was a very pressing one. He was convinced that roads could be made at a reasonable cost to withstand any motor traffic, and then their omnibuses would show a better return. At present the motors damaged the roads and the roads knocked the motors to pieces.

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SATURDAY, FEBRUARY 15, 1919.

PUBLIC SERVICES AND STRIKES.

No one can contemplate without indignation the spectacle recently afforded by the gradually extending "hold-up" of London's railway services. It is difficult to determine whether to lay the greater blame upon those who ceased work in total disregard of the results to others, or upon the state of law, or the want of law, that permits these wrongs to be inflicted upon the hapless public. That legislation has a knack of being either in advance of its time or far behind it, and never by any chance synchronising with people's needs and desires, is of course a notorious truth. In no instance is it more clearly demonstrated than in the absence from the Statute Book keeping trade disputes within reasonable bounds. Indeed, the only addition within recent years having any bearing upon the subject is of a retrograde character. On grounds which it is impossible for any logical mind to fathom, "the right to strike" has been given the character of sacrosanctity. It is high time that some attempt was made to protect the community against the repetition of such experiences. The ideal condition is, of course, that strikes should be illegal and impossible, but, things being what they are, it is doubtful whether so desirable an end can be attained, except perhaps by slow degrees. It may be urged that the Whitley Councils are a notable extra-legislative effort in the direction of averting labour upheavals, and they have yet to have a fair trial. At least they afford a groundwork upon which something satisfactory might be built, in which some progress might be made, and the British tradition of useful compromise be maintained. The community at large is tired of strikes, yet the workers and trades unions are not disposed to relinquish generally the power which strikes are supposed to confer upon them. Thus we must try to find a middle course that will give the maximum benefit to the nation and at the same time arouse the minimum of hostility on the part of those directly to be affected. This object would be well achieved by legislation providing that employment in public utilities should be subject to special conditions. These, on the one hand, would forbid any withdrawal of labour except on proper termination of contract of service, and, on the other, would prescribe safeguards as to the wages, etc., of workers. The Whitley Councils are a model for the machinery that might be set up. A schedule to an Act of this kind would specify the classes of undertaking coming within the definition of "public utilities" for the purposes thereof. It would, of course, include all railways and tramways, but it might not necessarily comprise all motor and omnibus services. With certain reservations as to the latter—of which only public ownership could dispose—the employees of these undertakings stand in a favoured position as compared with all others. Their tenure is far more secure, and their conditions of service include advantages not usually found in ordinary industrial employment. A strong argument, and one on which even labour as a whole could be converted, therefore exists for some differentiation in their case on the question of the so-called "right to strike." And there can be no question that the public, which has endured far too much, would be thankful if something on these lines could be achieved.

TRAMWAYS AND THE 48-HOUR WEEK.

ADOPTED BY GLASGOW AND DUNDEE CORPORATIONS.

Despite a warning by the Chairman of the Tramways Committee that such a measure would require consideration by that body from a financial point of view, Glasgow Corporation on February 6 agreed by 64 votes to 17 to a recommendation of the Special Committee on Conditions of Service that a 48-hour working week be instituted for all Corporation employees who are not already working these hours or less, without reduction in their existing weekly wages.

Coun. Smith Park suggested that, so far as the Tramway Department was concerned, consideration should be given to the necessity, in view of the increased expenditure the minute would involve, of raising the tramway fares. The tramway manager had stated that the effect of the proposals would be that not only would there be no surplus but a deficit of over £40,000—that, in fact, the drawings would not be sufficient to pay the bills for wages.

Coun. Robert Mitchell.—That is the manager's opinion.

Bailie Wheatley moved as an amendment that the working week be reduced to 40 hours, stating that if the Corporation agreed to that it would be the most glorious chapter in Glasgow's municipal history.

Coun. Kelly, chairman of the Tramways Committee, warned the Corporation that the proposals would require very serious consideration by the Tramways Committee from the finance point of view. The shorter hours would add £33,000 to the department's outlay, and the bonus would mean an additional £40,000. The present year was likely to show a deficiency on the tramways. (Coun. Izett: Not at all.) Coun. Kelly said the amount of money they had at the credit of reserves and of depreciation and renewals account was not sufficient at present to carry out renewals that were urgently required. The Corporation could not expect the tramways to be carried on with the present fares in face of the obligations that were being put upon them. The Committee did not want to oppose a shorter working week or good wages, but just as the Gas and Electricity Departments passed on increased costs to the consumer, the Tramways Committee must try to do so.

Dundee Tramways Committee has appointed a sub-committee at the suggestion of the general manager to act with him in connection with the introduction of a forty-eight hour week. Mr. Fisher stated that he would need to reorganise the whole system and as the matter would involve additional expenditure, he wished a sub-committee to act with him. The forty-eight hour week would come into effect as the result of the terms of an award likely to be issued shortly.

Newport Tramways Committee some weeks ago granted the application of their motormen and conductors for a 48-hour week. The announcement of the fact by the Chairman of the Committee at a meeting of municipal tramway representatives summoned to discuss the national demands of the men for a reduced working week caused some sensation.

West Hartlepool Council have granted the application of the employees at the tramway depot for a 47-hour week on the two-break system, without reduction in wages. Any employee who is more than five minutes late in the morning will not be allowed to start work until after mid-day.

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NEW AND PROSPECTIVE WORK.

Warrington Tramways Committee propose to double the track on the Sankey and Cemetery routes.

Southport Electricity Committee desire to borrow £132,000 for new plant at the electricity works.

Nottingham Electricity Committee's recommendations for the installation of new working plant at an estimated cost of £55,000 has been accepted by the Council.

Bexley Council requires £13,000 for the reconstruction of the tramway track, and has asked the War Office, the Ministry of Munitions and the Road Board for financial assistance.

Ilford Council is making application to the Local Government Board for sanction to a loan of £25,000, the expenditure required for the purchase of new plant, etc., for the electricity undertaking, which has been recommended by Mr. A. H. Shaw, the electrical engineer.

Leeds Sub-Tramways (Works Management) Committee, after considering proposals for an estimated expenditure on tramway permanent way of £70,000, have approved the plans and have directed the general manager to obtain tenders for material and labour for works in Boar Lane, Meadow Lane and Park Lane. Work on the reconstruction and renewal of highways in Boar Lane, Park Square and other streets is also to be undertaken at an estimated cost of £5,926.

West Hartlepool Council have authorised the Tramway Committee to purchase six new cars, three pairs of maximum traction trucks complete with electrical equipments, and nine sets of electrical equipments, at a total estimated cost of £24,187. The £15,375 required for the cars is to be borrowed if the Board of Trade permit. The passengers carried have increased from 3½ millions in 1914 to over 8 millions per annum.

Plymouth Corporation propose to spend £210,000 on tramway extensions and renewals, including a new line to the Laira district and further lines to connect the tramways of Plymouth and Devonport.

Hull Tramways Committee have presented a report recommending that the tramways should be carried beyond the city boundaries, and that in any Bill promoted by the Council for the extension of the boundaries to Hessle, Anlaby, Kirk-Ella, Willerby, Cottingham, Preston, and Hedon, powers should be obtained to take the tramways to those places, which are all within a five-mile radius. Steps are to be taken at once to extend the tramways to Newlands Park and Anlaby Road and over the centre of the city. The engineer has been asked to submit a scheme for a tramway along the river front, linking up the docks, quays, and ship-repairing establishments. The views of an outside expert are also to be taken on the Humberside scheme.

Bolton Tramways Committee propose to re-lay the track on the Daubhill route, and have approved of the purchase of the rails, points and crossings required.

Liverpool Town Council, on the recommendation of the Tramways and Electricity Committee, will make application to the Local Government Board for sanction to borrow £200,000 for generating plant and £190,000 for electric mains.

LONDON TRAFFIC CONTROLLERS' WORK.

The fourth meeting of the fourth year of the efficiency meetings of the Operating Department of the London Underground Railways and London General Omnibus Company was held on January 28 in the L.G.O.C. Training School, Milman's Street, Chelsea, Mr. H. E. Blain, operating manager, presiding over an attendance of about 300 members of the control staff. Papers on "A Day in a Traffic Controller's Office" were delivered by (a) Mr. A. Earle, Traffic Controller, District Railway; (b) Mr. D. Williams, Traffic Controller, Tube Railways; and (c) Mr. H. Wood, Traffic Controller, London General Omnibus Company. The papers described the physical equipment of railway and omnibus traffic control offices, and were also illustrated by slides. The important part played in traffic control by up-to-date methods was discussed and criticised, and a number of valuable suggestions made by the control staff in the excellent discussion which followed. The debate was opened by Mr. J. Moran, divisional inspector of the Omnibus Company, and Mr. R. Smith, divisional inspector, Tube Railway, and taken part in by a number of representative officials. An interesting evening was closed with a vote of thanks, proposed by Mr. W. M. Acworth, director of the London Electric Railway, and Mr. Murray Griffith, director of the District Railway. The next paper will be by Mr. A. R. Cooper on "Railway Engineering Matters."

Platform Riding Abolished.—Nothwithstanding that the Board of Trade regulations permit of three passengers riding on the platform of a car, Swansea Tramway Company on February 5 brought into force a rule forbidding the practice. This has been made to shorten running times, but with little success owing to obstruction caused by people standing on the platform. Those persons are chiefly smokers, boarding cars not containing a smoking apartment.

Dundee Tramway Fares.—The statutory minimum ordinary fare on the Dundee tramways is 2d., and by workmen's cars 1d. When this fact was mentioned in the Town Council some surprise was caused, and Mr. Peter Fisher, the general manager, exclaimed that the tramways department charged less than half of what they had the power to charge, and the public were able to travel for a penny and the workmen for a halfpenny per mile.

MISCELLANEOUS NEWS AND NOTES.

A Parliamentary Road Transport Committee, with a membership of over one hundred, has been formed in the House of Commons. Mr. Joynson-Hicks has been appointed chairman.

Tramway Shelter at Plymouth.—Plymouth Tramways Committee is considering the construction of a tramway shelter opposite the Theatre Royal to provide protection for waiting passengers.

Maidstone Light Railways.—The proposed extension of Maidstone light railways to Chatham and to the north of the town will, it is estimated, involve an expenditure of about £200,000.

Fine for Non-Payment of Fare.—For travelling a penny stage on the London County Council tramways without paying the fare, a woman passenger was fined 10s. at Lambeth police court on Monday.

Edinburgh to Run Motor Omnibuses.—The Lord Provost, Sir J. Lorne Macleod, has stated that the Corporation propose to acquire and to run motor omnibuses. The conversion of the tramways to electric traction would cost about a million pounds.

New Ministries.—The "Daily News" Lobby correspondent states that the Ministry of Commerce will be the name given to the Board of Trade after the Railway Department has been transferred to the new Ministry of Ways and Communications.

Sunday Services at Nottingham.—The resumption of the tramway service on Sunday was welcomed throughout Nottingham and the suburbs. It had been suspended owing to the shortage of conductors and coal restrictions.

New Cars for Bradford.—Bradford Tramways Committee propose to order twenty-six new tramway cars and fifty-two traction motors. The Chairman and Deputy Chairman have been empowered to place orders forthwith and to press for delivery at the earliest possible date.

Trolley Wheel Replacement.—At several curves in Nottingham a trial is being given to a device which assists the conductor in replacing the trolley wheel on the wire. It is a mechanical aid for bringing the trolley in line with the overhead wire, thus enabling it to be speedily set running.

Miners' Ballot on Strike.—The Miners' Federation have followed up their rejection of the Government's offer by deciding to take a ballot of their members on the question of a strike for the enforcement of their demands. Voting papers are to be returned by the 22nd of this month, and if the strike notices are issued they will expire on March 15.

Development of London Traffic.—Mr. Rees Jeffreys, chairman of the Special Committee of the Town Planning Institute, has an interesting letter in the "Times" of Friday on the proposal for the wider development of London traffic, in which he gives particulars of a scheme that has been drawn up by the London Society of the Town Planning Institute.

No Reduction in Railway Fares.—Mr. Bridgeman, Parliamentary Secretary to the Board of Trade, in reply to a question in the House of Commons, on Thursday, stated that no hope can be held out of an early reduction in the charges for season and ordinary tickets. The present position of the railways renders the continuance of the charges necessary.

Belgian Coast Tramways.—A correspondent of the "Daily Mail" says that the electric tramway which extends from Knocke south through Ostend to Westend, has been partially reopened. The lines pass close behind the coastal forts erected by the Huns, and passengers can look into the dug-outs and gun emplacements along the Belgian coast.

Traffic Congestion at Liverpool.—Suggestions for the construction of an underground railway are receiving the consideration of both the Tramways Committee and the Reconstruction Committee of Liverpool Town Council. One scheme includes underground tunnels linking the outer districts with the centre of the city, in which tramway cars would be run. An alternative scheme proposes the widening of roadways so as to obtain higher speeds with the tramway cars.

Belfast Tramwaymen and Unemployed Pay.—During the strike of shipyard hands in Belfast, the Tramways Committee are paying wages to the tramway employees, as they did not leave work of their own accord. When the matter came before the City Council, Councillor Turner, while not disagreeing with the payments, remarked that the men had a right to go to the Labour Exchange like other citizens thrown out of work by the withdrawal of power and light, and make a claim for unemployed pay.

Fatality to an Inspector.—While Inspector J. A. Smith, of the South Staffordshire Tramways Company, was riding on the rear platform of a car in West Bromwich, he sank on his knees and gripped the standard for support. Then he fell into the roadway, his head striking the ground. A doctor stated that death was due to a broken neck, but there was nothing to show what caused the collapse, all the organs of the body being healthy. The coroner's jury returned a verdict of accidental death.

The King's Speech at the opening of Parliament on February 11, contained the intimation that the House of Commons would be asked to approve of a Bill to establish a Ministry of Ways and Communications, with a view to increasing and developing the industrial and agricultural resources of the country by improved means of communication. It is understood that the Minister of Transport (Sir E. Geddes) is appointing a committee to consider the question of the extension of facilities, for transport as a part of the policy of development of rural areas.

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New Cars for Belfast.—The Tramways Committee have asked the general manager to furnish them with specifications for new cars to accommodate sixty persons. Councillor Stirling has suggested that the cars should have bogie trucks, and that if such trucks were unsuitable for existing curves the latter should be redesigned. Councillor Turner, chairman of the committee, said it was questionable whether bogie trucks would be suitable. The committee at present had under consideration the advisability of enclosing the ends of the upper decks and also the platforms.

Linking of Cardiff and Newport Tramways.—Addressing the Cardiff Rotary Club, Mr. Arthur Ellis, general manager of the Corporation tramways, suggested that there was no reason why, during the next few years, the Cardiff and Newport tramways should not be linked together. It would be necessary to extend tramways into suburban areas to help toward the developments that must come as part of the scheme for freeing the country from the menace of shortage of food. This would have the effect of relieving the railways and leaving them to deal with the longer distance traffic. Regarding the financial position of the tramways, he said the capital expenditure was £790,000. The invested capital amounted to £366,000, or in other words they had repaid by way of sinking fund 46 per cent. of the capital debt. They had paid £724,723 in interest and sinking fund, and the surplus funds amounted to £158,900. These moneys had been put aside to provide for reconstruction, etc. In 1903 the cars carried 18 million people, and in 1918 37 millions. The receipts had gone up from £78,000 to £171,000, and the gross profits from £27,000 to £87,000.

Scottish Tramways and Higher Fares.—Major Coutts, the secretary of the Scottish Tramway Officials' Association has sent us a copy of the resolution unanimously approved at a meeting held in the City Chambers, Edinburgh, on January 14, which was briefly referred to in a previous issue :—

"That the responsible officials of the Scottish Tramways Industry pledge themselves to call meetings of their directors and committees, and to advise and do everything in their power to induce these bodies to take united action until the responsible Government Departments admit, and take immediate steps to put into effect, the principle of allowing tramway undertakings to increase their present scales of tolls and charges by not less than 50 per cent. and not more than 100 per cent. Furthermore, that a copy of this Resolution be sent to the Chairman of each Tramway Committee and Board of Directors, to all Scottish Members of Parliament, to the various Government Departments concerned with tramway matters, and to the Secretaries of the Municipal Tramways Association, and the Tramways and Light Railways Association."

PERSONAL.

Mr. J. H. Thompson, of Carlisle, has been appointed electrical engineer to Colne Corporation, at a salary of £350 per annum.

Alderman R. T. Fletcher has resigned the chairmanship of the Wigan Tramways Committee on the ground of ill health.

Mr. C. C. Hawtayne has been appointed consulting engineer by Maidstone Town Council for the proposed extension of the tramways, in succession to the late Mr. Stephen Sellon.

Wolverhampton Corporation has fixed the salary of **Mr. C. Owen Silvers,** general manager and engineer of the tramways department, at £600 per annum.

Mr. G. W. Holford, general manager of Salford Corporation tramways, has been granted an increase in salary from £700 to £750 a year.

Sir Eric Geddes, in view of his duty as Minister of Ways and Communications, has resigned his appointment as deputy general manager of the North-Eastern Railway.

Lieut. Ernest Leighton, of the Air Force, who joined the Army in 1914, has now resumed his position as manager of the installation department of Messrs. C. A. Vandervell and Company.

Mr. C. F. Spencer, chairman of Halifax Corporation Tramways, has resigned the position of Director-General of the National Kitchens Division of the Ministry of Food, owing to the demands of his business engagements.

Mr. J. B. Hamilton, commercial manager, Leeds Corporation, has been elected as one of the seven representatives of the Council of the Association of Municipal Corporations on the National Joint Industrial Council for Local Authorities Non-trading Services.

Mr. T. W. Bloxam, chief electrical engineer to Belfast Corporation, has been granted an increase in salary from £800 to £1,000. In 1914 his yearly increase of £50 was arrested owing to the war, and the present increase is the amount he would have received by this time.

Management of Wigan Tramways.—From the applicants for the position of general manager of Wigan Corporation tramways the following short list has been selected :—Lieut. L. Bellamy (Ilkeston), Messrs. William Billington (Salford), H. Clayton (Preston), W. H. Ellis (Chester), Benj. Hall (Keighley), and A. B. Slater (Burton-on-Trent). The salary is £500.

Sir Arthur Stanley was on February 11 presented with his portrait, a silver salver, and an album containing the names of 630 subscribers on the headquarters committee and staff of the Red Cross and the Order of St. John, in recognition of his work as chairman of the Joint War Committee of those bodies. In reply Sir Arthur said he should give the salver to St. Thomas's Hospital. He intended to convene a Red Cross Convention at Geneva, with the object of promoting public health and infant welfare during the period of reconstruction.

Mr. John Wiseman, whose sudden death from pneumonia was mentioned in our last issue, had been in the service of the Edinburgh and District Tramways Company for over thirty years. He joined the company in the horse traction days as a clerk, was promoted assistant secretary and later became secretary.

FINANCIAL.

The Burmah Electric Tramways and Lighting Co., Ltd., has been registered with a capital of £200,000 in £5 shares.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Feb. 12, amounted to £67,317, an increase of £11,116 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to February 12 (forty-five and a half weeks) the total receipts were £3,017,200, an increase of £510,900 on the corresponding period of 1918.

Glasgow Receipts Fall.—Owing to the industrial disputes in Glasgow, there was a reduction in the tramways receipts last week For that week, which ended on February 8, the amount was £27,418, or £250 less than the previous week. The receipts for the thirty-six weeks of the financial year aggregate, however, over £1,035,000, and show an increase of £81,998 as compared with the corresponding period last year.

Llandudno and Colwyn Bay Electric Railway.—The report for the year ended November 30, shows that the total receipts amounted to £23,271, and expenditure, including interest on debentures and loans, to £15,333, leaving a balance of £7,938. Including £197 brought forward there is an available balance of £8,135. Of this amount sinking fund instalment requires £1,775, and £1,500 has been transferred to reserve for renewals. A dividend at the rate of 4½ per cent. per annum has been declared, leaving £387 to be carried forward. No construction work has been done during the year, but it is hoped to effect certain improvements at an early day.

Isle of Thanet Electric Tramways.—Since the Armistice was signed there has been a considerable improvement in the receipts of the Isle of Thanet Electric Tramways and Lighting Company. It was mentioned at the annual meeting held at the end of last week that the receipts for the past year of the tramways department showed an increase of £258, although the receipts for the lighting department fell off by £1,196, owing to the restrictions on lighting and the necessity for reducing coal consumption. The accounts for the year ended September 30, 1918, showed a loss of £4,817, and deducting the credit balance of £3,825 brought forward, there is debit balance of £992 to be carried forward. In the previous year the loss was £4,731.

CONTRACTS AND ORDERS.

Messrs. Ward, Haggas and Smith are supplying a 9½ inch centre lathe at £310 to Bradford Corporation tramways.

The British Thomson Houston Company, Ltd., have an order from Walsall Electricity Committee for a traction rotary of £3,439.

Dundee Tramways Committee invite tenders by February 24 for one year's supply of armature coils, commutators, mica castings, wheels, lamps, etc. Forms of tender may be obtained from the General Manager, Town House Buildings, Dundee.

New Cars for Rotherham.—Rotherham Corporation Tramways are inviting tenders for the supply of tramway cars and car bodies, etc., particulars of which will be found in our advertisement columns.

Sheffield Corporation have been recommended by the Tramways Committee to accept the tender of the Brush Electrical Engineering Company, Ltd., for 50 double-deck, top covered, vestibule tramway car bodies and trucks, at £102,500, with 5 per cent. for contingencies. This price works out at £2,050 per car.

J. W. Courtenay, Ltd., of Amberley House, Norfolk Street, London, W.C., who have been advertising contractors for the Edinburgh and District Tramways Company, Ltd., have now been appointed sole advertising contractors to the Edinburgh Corporation tramways. The lease of the Edinburgh and District Tramways Company terminates on June 30, 1919, and before deciding whether the Corporation would continue to use the cars for advertising purposes the Tramways Committee and the general manager considered the matter carefully. In view of the increasing burdens upon ratepayers they came to the conclusion that it would be unwise to forgo the revenue which the Corporation will derive from this source.

DICK, KERR & Co.,
Limited,
ABCHURCH YARD, CANNON STREET
LONDON, E.C.,
ENGINEERS & CONTRACTORS.
Complete Equipment
TRAMWAYS & LIGHT RAILWAYS
at home and abroad

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POSITIONS VACANT.

COUNTY BOROUGH OF BELFAST.

Belfast City Tramways.

Assistant Permanent Way Engineer.

The Tramways Committee invite applications for the above position from fully qualified Civil Engineers (under 40 years of age) with practical experience in the maintenance, renewal and construction of tramway permanent way. Candidates must be accustomed to the control and management of considerable bodies of men and have a thorough knowledge of the requirements of a modern permanent way department.

Salary £350 per annum rising to £450 per annum by annual increments of £25.

Applications on the official forms, which may be obtained from Mr J. S. D. Moffet, General Manager, Tramways Office, Sandy Row, Belfast, to be delivered at my Office, City Hall, Belfast, not later than 12 noon on Friday, February 21st.

R. MEYER,
Town Clerk.

Traffic Superintendents.

Two Resident Traffic Superintendents wanted for large tramways in London. Commencing salary from £350 per annum. Candidates must have experience in control of staff and in the duties of inspectors, motormen and conductors.

Applications stating age and experience, with copies of not more than three testimonials, to BOX No. 19, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

TENDERS INVITED.

COUNTY BOROUGH OF EAST HAM.

To Tramway Contractors.

Tramway Reconstruction.—Romford Road.

The Corporation invites Tenders for the Reconstruction and Repaving of the Electric Tramway Track and the Road Margins of Romford Road, from High Street North to the Ilford Boundary.

Copy of Specification, Conditions and the Form of Tender may be had on appplication to Mr. J. Birch, Borough Engineer, Town Hall, East Ham, or of Mr. W. C. Ullmann, M.I.E.E., Tramways Engineer and Manager, Nelson Street, East Ham, on the payment of the sum of £2 2s., which will be returned on receipt of a bona-fide Tender.

Sealed Tenders, endorsed "Tender for Tramway Reconstruction," to be addressed to "His Worship the Mayor, Town Hall, East Ham, E.6," and to be delivered not later than 12 o'clock noon Monday, March 3rd, 1919.

The person or persons whose Tender is accepted will be required to observe and fulfil the obligations upon Contractors specified in the Fair Wages Resolution adopted by the House of Commons on the 10th March, 1909, which is fully set forth in the Form of Tender, and to enter into a contract with a bond for the due performance thereof.

No contracts will be given to any firms connected directly or indirectly with the enemy powers, and as far as is possible preference will always be given to genuinely British firms employing British labour.

The Corporation does not bind itself to accept the lowest or any Tender.

By order,
C. EUSTACE WILSON,
Town Clerk.

Town Hall, East Ham, E.6.
5th February, 1919.

ROTHERHAM CORPORATION TRAMWAYS.

Electric Tram Cars, Bodies, Electrical Equipment and Trolley Buses.

The Tramways Committee are prepared to receive Tenders for the supply of—

(a) 4 (four) Double Deck, Top covered, Single Truck Tram Cars, and 12 (twelve) Tram Car Bodies with electrical equipment complete.
(b) Tram Car Motors.
(c) 2 (two) complete Trolley Buses.
1 (one) Trolley Bus Body.
1 (one) Trolley Bus Chasiss.

Further particulars and specifications may be obtained on application from the Tramways Manager, St. George's Hall, Rotherham.

Tenders to be addressed to me, and to be received not later than 12 noon, 10th March, 1919, endorsed "Tenders for Tram Cars or Trolley Buses," as the case may be.

CHAS. L. DES FORGES,
Town Clerk.

Rotherham, February 13th, 1919.

ROYAL BURGH OF AYR.

Advertising on Tramway Cars.

The Town Council invite tenders for the sole right of advertising on their 23 Electric Tramway Cars for a period of five years.

Specification and form of tender may be obtained on application to W. Grant, A.M.I.E.E., General Manager, Town Buildings, Ayr.

Sealed tenders, endorsed "Advertising on Tramway Cars," addressed to the undersigned, must be delivered by post not later than noon on February 26th, 1919.

The Council do not bind themselves to accept the highest or any tender.

P. A. THOMSON,
Town Clerk.

February 11th, 1919.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C. ..	Feb. 4	492	503	+ 11	44	22,537	—
Aberdeen Corporation ..	" 5	2,315	2,515	+ 200	36	93,828	+ 15,801
Ayr Corporation ..	" 8	329	391	+ 62	38	23,044	+ 4,824
Birkenhead Corporation	" 9	1,885	2,022	+ 137	45	98,401	+ 15,221
Blackburn " ..	" 5	1,570	1,620	+ 50	35¾	79,714	+ 12,399
Bradford Corporation ..	" 8	7,018	9,064	+ 2,046	45	416,992	+ 72,985
Burnley Corporation ..	" 8	2,023	2,616	+ 593	..	..	..
Burton-on-Trent Cor. ..	" 9	386	395	+ 9	45	18,616	+ 4,092
Bury Corporation ..	" 9	1,551	1,947	+ 396	45	91,876	+ 17,983
Chatham & District ..	Jan. 30	1,114	1,175	+ 61	4	5,106	+ 285
Cork Electric	" 30	573	525	— 48	4	2,321	— 86
Derby Corporation ..	Feb. 8	1,211	1,402	+ 151	45	67,368	+ 12,445
Dundee City	" 5	1,723	1,956	+ 233	38	74,377	+ 14,931
East Ham Corporation ..	" 8	1,333	1,590	+ 257	44¾	70,419	+ 8,982
Glasgow Corporation ..	" 8	26,754	27,418	+ 664	36¼	1,036,968	+ 81,998
Glossop (U.E. Sup. Co.) ..	" 8	181	206	+ 25	6	1,229	+ 178
Halifax Corporation ..	" 4	2,109	2,629	+ 520	44¼	125,487	+ 17,073
do. Motor Buses ..	" 4	48	66	+ 18	44¼	2,978	+ 791
Huddersfield Corporation	" 8	3,119	3,548	+ 429	45	163,289	+ 21,258
Ilford U.D. Council ..	Oct. 12	713	1,000	+ 287	22	28,593	+ 6,779
Ipswich Corporation ..	Feb. 8	600	639	+ 39	45	33,438	+ 3,562
Isle of Thanet ..	" 8	200	257	+ 57	18¾	5,757	+ 2,527
Kilmarnock Corporation	" 8	217	275	+ 58	38¾	10,283	+ 2,352
Lanarkshire	Jan. 30	2,952	3,595	+ 643	4	16,579	+ 3,792
Leeds City	Feb. 8	10,830	13,647	+ 2,817	45	608,879	+ 114,508
Leicester Corporation ..	" 8	4,285	4,743	+ 458	..	..	..
Leyton U.D. Council ..	" 6	1,735	2,292	+ 557	45	106,747	+ 22,606
Liverpool Corporation ..	" 8	16,644	19,244	+ 2,600	5¾	109,927	+ 18,762
Llandudno & Colwyn Bay	Jan. 31	236	267	+ 31	9	2,648	+ 628
London County Council ..	Feb. 12	56,201	67,317	+ 11,116	45¼	2,017,200	+ 510,900
Maidstone Corporation ..	" 6	243	245	+ 2	44¾	12,732	+ 1,688
Manchester Corporation	" 8	23,080	27,757	+ 4,677	45	1,175,267	+ 227,501
Newcastle-on-Tyne Cor.	" 8	8,447	7,840	— 607	45	400,890	+ 46,6[illegible]0
Northampton Cor. ..	" 7	923	950	+ 27	45	39,845	+ 1,849
Nottingham Corporation	" 6	4,740	5,813	+ 1,073	45	258,169	+ 56,470
Oldham Corporation ..	" 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation ..	" 6	1,109	1,233	+ 124	44¾	58,057	--
Rhondda Tramways ..	Jan. 30	1,650	1,997	+ 347	4	8,897	+ 2,525
Rotherham Corporation	Feb. 12	2,053	1,987	— 66	45¾	104,145	+ 20,730
Sheffield Corporation ..	" 9	12,933	12,529	+ 404	45¾	606,821	+ 49,992
Southampton Cor. ..	" 5	2,242	2,135	— 107	44¾	112,369	+ 19,661
Southend-on-Sea Cor. ..	" 5	671	969	+ 298	45	58,905	+ 19,433
South Shields Cor. ..	" 4	1,072	1,154	+ 82	40	46,121	+ 7,881
Sunderland Corporation..	" 8	1,985	2,341	+ 356	45	98,725	+ 14,962
Swindon Corporation .	Jan. 29	282	282	+ Nil	43¾	13,480	+ 1,581
Torquay Tramways ..	" 30	703	657	— 46	4	3,115	+ 357
Tyneside Trys. & Trmrds.	" 22	730	823	+ 93	4	2,655	+ 229
Wallasey Corporation ..	Feb. 8	1,430	1,848	+ 418	44¾	84,597	+ 13,960
Walsall Corporation ..	" 8	1,112	1,202	+ 90	45	55,851	+ 10,730
Walthamstow U.D. Coun.	" 8	1,170	1,252	+ 82	45	64,640	+ 9,959
Warrington Corporation	" 6	752	816	+ 74	45	34,954	+ 8,281
West Ham Corporation	" 6	3,551	4,445	+ 893	44¾	204,746	+ 41,145
Wigan Corporation .	Jan. 2	2,357	2,424	+ 77	39	96,562	+ 15,560

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Feb. 4	£50,620	£58,942	5	£251,941	— £6,094
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo(4 wks)	Dec. 8	3,228	3,884	36	30,974	+ 2,168
Brazilian Traction (Mlrs.)	Nov.	7,695,000	7,581,000	48	93,363,000	+ 9,232,000
Brisbane	Jan.	34,500	38,575	4	38,575	+ 4,075
British Columbia .. $	Dec.	555,555	691,065	26	3,418,095	+ 494,435
Buenos Aires Lacroze ..	Jan.	38,902	41,556	30	300,780	+ 31,403
Burmah Tram. & Light Rs.	Dec.	26,224	34,593	21	176,539	+ 40,719
Calcutta .. .. Rs.	Feb. 1	71,333	82,762	4¼	397,303	+ 48,725
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Jan.	4,011	3,655	4	3,655	— 356
Cordoba	Aug.	14,233	15,734	21	79,054	+ 8,740
East India	Jan.	1,176	1,970	26	11,923	+ 4,474
Hong Kong.. .. $	Dec. 14	11,762	13,006	50	689,742	+ 18,333
Kalgoorlie	Sept.	3,063	2,947	39	25,070	+ 942
La Plata	Jan.	4,711	5,730	4	5,730	+ 1,019
Lima	Nov.	37,249	44,948	48	479,952	+ 82,898
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Dec. 31	46,646	43,146	52	942,232	+ 94,912
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	— 83,959
Manila .. .. $	Nov.	159,000	214,292	48	2,090,630	+ 466,897
Montevideo	Dec.	34,025	38,441	8	70,139	+ 5,064
Pernambuco	Feb. 2	4,759	5,497	4½	25,122	+ 1,617
Peruvian .. .. $	Jan.	1,189,350	1,009,650	30	7,030,365	— 247,255
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Dec.	5,438	6,188	52	71,992	+ 11,174
Shanghai .. .. $	May 29	24,611	24,708	21	523,298	+ 20,542
Singapore .. .. $	Jan. 4	13,119	14,909	1	14,909	+ 1,790
Toronto .. .. $	Nov.	1,052,000	1,071,106	48	11,716,181	+ 729,183
Winnipeg .. .. $	Nov.	305,881	283,721	48	3,252,863	+ 213,466

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THE
Tramway AND Railway World

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SATURDAY, FEBRUARY 22, 1919.

TRAMWAY EMPLOYEES' DEMANDS.

NEGOTIATIONS between the representatives of the National Transport Workers' Federation and of the two tramway associations were resumed in London yesterday (Friday) after the adjournment of the meeting in Leicester last week. At that meeting the employers offered to agree to a 48-hours week with the payment of wages based on a 54-hours week: This proposal representatives of the Federation declined to accept, but it was agreed that a further effort should be made to reach a compromise. It must be admitted, however, that the position is critical; for the full demands made in the national programme cannot possibly be granted. The employers fully recognise that the men are entitled to a shorter week and to a higher rate of remuneration; but the conditions of the tramway industry are such that it would be impossible to pay the same wages for a 48-hour week as are now being paid for the present working week. The additional charge which would be placed on tramways as a whole by the granting in full of the demands would, it is estimated, amount to nearly two and a half million pounds—a burden that could not be borne. Tramway-owning corporations and companies have responsibilities towards the public which they cannot lightly disregard. The great majority of regular passengers are themselves wage-earners, and many of them are less favourably situated than tramway employees. Yet upon the passengers must ultimately fall the principal part of any further burden that the employees place upon the undertakings. In the tramway industry, as is well known, there is no large balance of profit which can be drawn upon. With very few exceptions the undertakings have only been able to show small margins of profit; and in many cases such profit has been largely illusory, because insufficient allowances have been made for depreciation and upkeep. Fares have, no doubt, been too low; but they have been kept so in order to give the public the maximum of advantage. In the changed conditions that now prevail, larger fares must be anticipated, notwithstanding the increases that have been made during the past year or two. But the advisers of the employees should not lose sight of the fact that increases in fares cannot go on indefinitely. A point would very soon be reached when traffic would fall off, and insolvency would result. As in the case of other industries, what is necessary is a flood of light on the conditions of tramway operation. As so large a proportion of the tramways of the country are publicly owned, there can be no reason for secrecy, and the fullest publicity ought to be given to all the facts so that the public may form an accurate judgment on any claims put forward by the employees. This will be the more necessary in the future, because there are still other demands to be made, whatever terms may be granted as a result of the present agitation.

L.C.C. TRAMWAY MATTERS.

LINKING UP AND EXTENSIONS OF LINES.

At the fortnightly meeting on Tuesday the London County Council approved the recommendation of the Highways Committee that Parliamentary powers should be sought in the present session fo Parliament for the linking up an extension of the tramways. All the extensions proposed were contained in a scheme submitted in 1914. The lines are urgently required and the Committee recommended that they should be proceeded with at the earliest possible moment. In spite of the high cost of the work under present conditions, each of the proposals will be of immediate financial benefit to the undertaking. In only two cases will the work involve street widenings. Three of the proposals are for linking up or abolishing dead ends, two being complementary to each other for the purpose of linking up the southern tramways at Blackfriars Bridge with certain routes on the northern system. The need for satisfactory connections allowing the passage of double deck cars between the northern and southern systems is well understood. The remaining three proposals provide for the extension of existing central terminals nearer to large traffic centres. The following list gives particulars of the six lines proposed :—

		Single line. m.	f.	c.	Estimated cost. £
1.	Charles Street to Blackfriars	1	3	1	83,490
2	Gray's Inn Road to Farringdon Street		5	6	50,700
3.	Aldgate Terminus to Aldgate Station		1	1	22,490
4.	Hampstead Road to Oxford Street	1	2	7	79,760
5.	Seven Sisters Road to Stamford Hill	1	2	6	52,160
6.	Southampton Row to New Oxford Street		3	6	30,890
		5	2	7	£319,490

The estimated capital cost is exclusive of cars, car sheds, substations and sites for such buildings, as expenditure on these heads is common to more than one route. The existing car sheds and substations would be utilised. The underground conduit system would be used on all routes except No. 5.

The Finance Committee concurred in the proposal to apply for powers for the proposed lines and in their report stated that the total cost of the extensions, including the proportion of street widenings chargeable to the tramway account would be £440,190. While the new expenditure for construction and equipment (£418,215) is very high, owing to the present conditions, each scheme is estimated to show a surplus on working. The report alludes to the difficulty of estimating financial results, for not only are receipts and working expenses abnormally high at present, but it is difficult to estimate exactly the capital cost of the tramways. The figures upon which the estimates have been based are approximately 100 per cent. above pre-war prices. The debt charges will consequently entail a very heavy burden on revenue and will require a larger margin of revenue over working expenses than under pre-war conditions.

AUXILIARY OMNIBUS SERVICE.

In reporting upon the proposals of the Highways Committee for the establishment of an auxiliary omnibus service (particulars of which were given in our issue of February 13), the Finance Committee stated that if the estimates submitted to them by the Highways Committee are realised, the Council would not be involved in any financial loss upon the running of the omnibuses, without taking into account any increase of revenue which may accrue from induced traffic on the tramways. The proposal that the Council should contribute on the basis of ⅜ths. of a penny an omnibus mile to the road authorities, the Finance Committee remarked, raised a difficult question of principle. They understood that it might be modified in certain directions by the Highways Committee.

OMNIBUS SERVICES AND "ROAD TAX."

On the report of the Highways Committee with regard to omnibus services, Mr. H. H. Gordon objected to the suggested charge of ⅜d. per omnibus mile on the ground that anything that made traffic dearer was prejudicial to the community. If the proposal was agreed to there was no justification for not also taxing any vehicle using the road.

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Dr. Scott Ligdett said that the scheme was perfectly sound, but there should be no tax on locomotion. If a tax was imposed it must be equitable and fall on all kinds of traffic in proportion to the injury they did to the highways.

The debate was adjourned till the next meeting of the Council on March 4.

WAGES OF MOTORMEN AND CONDUCTORS.

Mr. G. H. Hume, chairman of the Highways Committee, reported that the National Transport Workers' Federation had asked the Council, in common with other tramway undertakings throughout the country, to grant a working week of 44 hours and other concessions. (The terms of the demands were given in our issue of January 16.) The present wages averaged £3 8s. 3d. for drivers, £3 1s. 9d. for male conductors, and £2 15s. 3d. for women conductors.

NEWCASTLE GRANTS EMPLOYEES' DEMANDS.

A 44-HOUR WEEK FOR ALL CORPORATION EMPLOYEES.

Newcastle City Council unanimously adopted a resolution on February 12, that the normal working week of all employees of the Corporation should not exceed forty-four hours. Labour-employing committees have been instructed to confer and report to the March meeting of the Council as to how the proposal can be put into immediate and practical operation.

In the course of the discussion on the matter, Mr. R. Mayne, chairman of the Tramways Committee, moved an amendment that the various committees employing labour should consider the practicability of reducing the working hours of their employees and report thereon to the Council. but the amendment was negatived. A letter was read from the local branch of the Tramway and Vehicle Workers' Association, enclosing a resolution passed at a meeting of the tramway employees on the previous night, adhering to the principle of a forty-four hour week for all Corporation employees, as granted to car builders, engineers, and other grades on the tramways. The general opinion expressed by speakers at the Council meeting was that the time had arrived when workers' hours should be reduced. As a result of the change, ratepayers might be saddled with an addition of 1s. 1d. in the £ next year. Alderman J. Fitzgerald, in supporting the resolution, blamed the Tramways Committee for the effect of it, as that body had already conceded a forty-four hour week to a certain section of the employees.

MISCELLANEOUS NEWS AND NOTES.

Sunday Services at Sunderland.—The Sunday service of cars has been restored at Sunderland, and the week-day service extended from 9.30 to 10.30 p.m.

Increased Fares at Douglas.—Douglas Town Council has decided to seek powers from the Manx Legislature to increase the maximum rates from 2d. to 3d. Owing to the increase in wages and other expenses, there is a deficit on the working of the tramways.

Tramways (Board of Trade) Committee.—The Tramways (Board of Trade) Committee is to be dissolved. The Committee is winding up its affairs this month, and its offices will be closed after February 28.

Increase in Burnley Services.—On February 15 a temporary increase in Burnley tramway services was made. Instead of the usual ten-minute service in the forenoon cars now run every five minutes from 9.30 a.m.

Letter Boxes on Tramway Cars.—Bradford Town Council desire to have letter boxes replaced on the tramway cars from which they were removed during the war, and are accordingly making representations to the postal authorities.

Season Ticket Concession on the Underground.—The Metropolitan District Railway have given season ticket holders six days' extra travelling to compensate them for the time during which there was no service on account of the strike.

Scottish Tamway Fares.—The Scottish Tramways Association has appointed a sub-committee to investigate the question of fares and ascertain what can be done through the Board of Trade. Sanction is wanted for a general increase on the maxima allowed by statute.

Repairs at Birmingham.—Material for repairs is now being obtained with greater freedom and the Birmingham Tramways Committee anticipate that they will shortly be in a better position to undertake much needed renovation work. The labour difficulties have had a retarding influence and only recently a large consignment of copper wire was delayed by a strike of metal workers.

Manchester Traffic.—The Manchester tramways have 685 cars, and of these 600 are reported to be in a serviceable condition. More men are returning from the Army, and the Committee hope soon to have practically all the cars in working order. Until 150 new cars have been obtained it is not, however, expected that the service will equal that of pre-war times. Much of the present congestion is attributable to the change of hours in the engineering trade.

Institution of Electrical Engineers.—A paper on "The Determination of the Efficiency of the Turbo-Alternator," by Dr. S. F. Barclay and Dr. S. P. Smith, will be read at the meeting of the Institution of Civil Engineers, Great George Street, S.W., on Thursday, the 27th inst., at 6 p.m. On account of the author's illness, the paper on "The Co-ordination of Research in Works and Laboratories" will be read at a later date.

Underground Railways for Manchester.—Manchester Town Council is considering the appointment of a special committee to deal with proposals for the construction of underground railways.

Overcrowding on Trains and Tramcars.—Replying to a question in the House of Commons on Monday, Mr. Bridgeman, for the Board of Trade, said that they were well aware of the congestion on suburban trains, but he was afraid that no immediate remedy could be found. Men were now being released from the Army and more material was becoming available, but some time must elapse before arrears could be overtaken as regards tramways, omnibuses and tube railways.

Obstruction of Tramways.—Messrs. Thorley, Ltd., were summoned at the South Western Police Court for causing an obstruction on the L.C.C. tramways. A wheel of a van belonging to the defendants collapsed on the road, which was blocked for a lengthy period. For the defendants it was contended that the collapse took place through faulty rails. Mr. D'Eyncourt said that as accidents of this character were sometimes caused by defective metals, he thought that the justice of the case would be met by payment of costs.

Norwich Tramway Service.—A special committee of the City Council is investigating the complaints with regard to the service. The tramways are owned and worked by the Norwich Tramways Company, and the "Eastern Daily Press" remarks that there is no question that the mass of citizens were never so disaffected with the service as at the present moment. Under pressure of war time necessities, the Corporation has never enforced certain concessions given them by the Supplementary Act of 1914, but the Corporation are desirous that a better service should now be provided.

The Institution of Automobile Engineers.—The seventh meeting of the session of the Institution of Automobile Engineers will be held on Wednesday, March 5, at the Royal Society of Arts, John Street, Adelphi, W.C., at 8 p.m., when Capt. G. W. A. Brown will read a paper entitled:—"The Lubrication of Motor Cars." Cards of invitation to the meeting may be obtained on application to the Secretary of the Institution of Automobile Engineers, 28, Victoria Street, Westminster, S.W.1. A meeting will also be held at Birmingham on March 20, when Mr. Eric Caudwell will read a paper on "The Engine of the Sidecar Motor-Cycle."

Municipal Tramways Association.—The Proceedings of the Municipal Tramways Association, Incorporated, for 1917-18, which have just been published by the Association (price 5s.), include a full report of the annual conference held at Leicester in September last. The draft constitution for a National Joint Council for the tramway industry submitted to the constituent associations, (which was presented to the conference, but the publication of which was then withheld) is now given. A list of members, including both local authorities and the managers and their principal assistants, is appended and a photograph of the President of the Association for 1917-18, Alderman S. Flint, J.P., forms a frontispiece.

Glasgow Halfpenny Fares.—One of the Glasgow newspapers has made the suggestion that halfpenny fares should be abolished, and that other fares should be increased by 50 per cent. It is hardly likely, however, that the champions of the halfpenny ticket will be defeated. Ever since the service was municipalised in July, 1894, the halfpenny fare has been the mainstay of the undertaking Originally the distance allowed for a halfpenny was three-quarters of a mile, and in 1911 that distance was doubled. In 1918, out of 431,000,000 passengers, no fewer than 373,000,000 bought halfpenny tickets and provided over 40 per cent. of the total revenue. Under present circumstances it will probably be found impossible to continue to carry passengers for a mile and a half for a halfpenny.

National Electricity Supply.—The Incorporated Municipal Electrical Association on Friday of last week passed a resolution expressing great concern at the suggestion that the future control of electricity supply should be taken out of the department of the Board of Trade and be placed under the proposed Ministry of Ways and Communications. They point out that electricity supplies to factories and commercial and other users largely preponderate over supplies to railways and other undertakings coming under the control of the proposed new Ministry. They fear that such control would be exercised in the interest of transportation to the detriment of the general supply of electrical energy: The Association of Consulting Engineers have issued a memorandum on the question of National Electricity Supply, in which they urge that the Electricity Commissioners should be armed with wide and effective power to act in an executive capacity. The Electrical Section of the Newcastle Chamber of Commerce has recently endorsed this view.

Belfast Service Resumed.—On Sunday, February 16, there was a partial resumption of the tramway service, which had been practically suspended since January 25, owing to the stoppage of the power station by the general strike. The tramway employees had made a claim for a week's wages in connection with their abortive restart on the previous Tuesday and a number of them decided not to go to work, but about 70 of the 600 employees responded to the call. Later there was some interference with the running of the cars, the trolleys being pulled off the wire. Soldiers who remonstrated were badly treated. A large force of police surrounded each car as it arrived, but they were unable to prevent its being attacked. The service was consequently held up for some time and at 9 o'clock the cars were taken off, there being insufficient men to provide relief. A partial service was given on Monday, and on Tuesday the full service came into operation, the men returning to work on the understanding that they would be paid for last week. The general strike collapsed this week, and the great majority of the men returned to work on Thursday.

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Passengers must Show Tickets.—A passenger on a London County Council tramway car was fined 40s., at the Clerkenwell Police Court, Islington, for failing to produce a ticket when requested to do so by an inspector. The magistrate said there was a decision in the Supreme Court that a passenger must, when requested by a tramway employee, give up the ticket.

Snowstorm Interrupts Tramway Traffic.—A heavy snowstorm raged throughout the Midlands and the North on Monday. In the Peak of Derbyshire the storm was the severest known for years. Railway and tramway traffic was much interrupted, and later in the week in some districts considerable trouble was caused by floods. In some outlying districts of London services were stopped for a time. The cars of the Leyton District Council were checked by floods at the top of Lea Bridge Road, where the River Lea overflowed its banks. Cars were stopped at both ends of the flooded area and passengers were carried across the water by a horse and van, continuing their journey in cars on the other side. The services of the London United Tramways were also interrupted from the same cause at Mitcham.

Eight-Hour Day at Newport.—At the last meeting of the Newport Town Council, Mr. W. A. Linton, chairman of the Wages and Salaries Committee, inquired why the Tramways Committee had granted an eight-hour day for the employees without reference to the Wages and Salaries Committee, as required by standing orders? Mr. J. Moxon, chairman of the Tramways Committee, in reply, inquired whether anyone had the pluck to propose that the tramway men be not granted an eight-hour day. After a proposal that the Council should express regret at the action of the Tramways Committee, the Chairman said that there was no foundation for the statement that the matter had been settled without reference to the Wages and Salaries Committee. A report of the tramways manager had been before the Salaries Committee in which it was shown that the total charge would amount to £4,500 a year in wages, but that it would yield an increased and accelerated service. The motion of regret was negatived.

Light Railways Wanted.—Denbigh County Council are urging the construction of light railways in certain parts of the county. Such lines it is thought would be the means of opening up the county and assisting in its administration.—Wigton Urban District Council and the adjacent councils are endeavouring to make arrangements for the construction of a light railway by the State from Wigton to Castle Sowerby, and a conference of local authorities in the Wigton and Penrith districts has been convened. Holland County Council has received a report from the special committee on light railways in the county. The report states that two million tons of produce and materials are transported from farms to points three miles distant on the average, representing transport costs of £300,000. It is estimated that a saving of about £150,000 can be effected if the work is done by railways. The rates for road maintenance since March, 1902, show an increase of 100 per cent. The estimated cost of construction per mile of light railway is £7,454, which for the proposed eighty-five miles would give a total cost of £640,000.

PERSONAL.

Mr. J. A. Crowther, electrical engineer of Wallasey, has been granted an increase in salary to £800, by four yearly instalments of £50.

Mr. Thomas Clarkson has been elected president of the Institution of Automobile Engineers for the ensuing year.

Mr. A. Letts, electricity station superintendent of Lincoln, has been granted an increase in salary to £300 per annum, rising by two annual increments to £350.

Mr. R. R. Greene, tramways manager of Wallasey Corporation, has been granted an increase in salary to £700 by two instalments of £50 per annum.

Mr. J. J. McGregor has been appointed charge shift engineer and boiler house superintendent at Greenwich power station of the London County Council at a salary of £300, rising to £400 per annum.

Lieut. V. H. M. McMahon, A.M.I.E., R.A.S.C., M.T., of Claremont, Queen's Road, Cheetham, Manchester, was married to Miss Alice Winifred Hodson, of Octagon House, Fairfield, Manchester, on February 19, 1919, at St. Ann's Church, Fairfield, by the Rev. Father Brennan, assisted by the Rev. Father Shean, M.R., Rector of St. Chad's, Cheetham, Manchester.

Wigan Tramway Management.—The six selected candidates whose names were mentioned in last week's issue, appeared before the Wigan Tramways Committee, and it was finally decided that the appointment should be given either to Lieut. L. Bellamy, R.E. (prior to enlistment tramway manager and electrical engineer, Ilkeston), or Mr. Benjamin Hall (assistant electrical engineer and tramways manager, Keighley.)

FINANCIAL.

Dover Tramway Estimates.—The estimates submitted to the Dover Tramways Committee show a probable deficit for the year ending March, 1920, of nearly £10,000, due principally to the heavy cost of track repairs. Powers for a loan are to be sought for the purchase of several new cars.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Feb. 19, amounted to £64,025, an increase of £12,107 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to February 19 (forty-six and a half weeks) the total receipts were £3,081,229, an increase of £523,011 on the corresponding period of 1918.

Mather & Platt, Ltd.—A dividend at the rate of 17½ per cent. per annum, free of income tax, has been declared on the ordinary shares for 1918.

Liverpool Overhead Railway Co.—A dividend has been declared at the rate of 5 per cent. per annum on the preference shares and 4 per cent. per annum, making 3¼ per cent. for the year, on the ordinary shares, leaving a balance of £6,119 to be carried forward. The gross receipts under the terms of agreement with the Government amounted to £143,361 and the working expenses, including appropriation to reserve funds, to £113,234, leaving £30,127. Deducting debenture interest (£6,755) and including the balance brought forward (£6,928) there is a balance available for dividend of £30,300.

The English Electric Co., Ltd., has now gone to allotment. It will be remembered that this company, having arranged to acquire the whole holding of Preference and Ordinary Shares in the Coventry Ordnance Works, Ltd., and the Phœnix Dynamo Manufacturing Co., Ltd., made an offer to the shareholders of Dick, Kerr & Co., Ltd., to exchange shares on certain terms. It is now announced that about 90 per cent. of the Dick-Kerr shareholders have accepted the offer. The English Electric Company, Ltd., will control directly or through Dick, Kerr & Co., Ltd., the following powerful group of manufacturing interests, viz.—The Coventry Ordnance Works, Ltd., Dick Kerr & Co., Ltd., the United Electric Car Co., Ltd., and Willans & Robinson, Ltd. The company is registered with a capital of £5,000,000 in 1,500,000 £1 Preference and 3,500,000 in £1 Ordinary Shares, and the issued capital on allotment is just under £2,000,000.

Leeds Tramway Estimates.—The Leeds Tramways Committee received from the general manager, Mr. J. B. Hamilton, on Tuesday, the estimates for the current and coming financial years. For the current year it is estimated that the revenue in traffic receipts will amount to £716,440. Including sundries, estimated at £8,530, there is a total of £724,970, an increase of £138,339 as compared with last year, or 26 per cent. The increase in income is attributed mainly to the increase in fares which took place in June last. The estimated number of passengers for the current year is 113,129,800, or a decrease of 9 per cent. It is expected that in the following year it will be possible to run more cars in order to cope with the increased traffic, and an additional income is anticipated of £77,670, making an aggregate of £802,640. The surplus profit applied to the relief of the rates last year was £38,000. The increased income does not, of course, indicate a prospective increase in profits owing to the great advance in war bonuses and the cost of material. The wages bill for the current year is approximately £258,000, or £60,500 more than last year, but the full effect of the advance has not yet been felt, as the whole of the increase was not paid throughout the year.

CONTRACTS AND ORDERS.

Dick, Kerr and Co., Ltd., have received an order for 18 sets of electrical equipment for tramcars from West Hartlepool Corporation.

Mirrless Watson Co., Ltd., are supplying a multi-jector air pump for Pinkston, Glasgow, power station.

Albion Motor Car Co., Ltd., are supplying a 3-4 ton lorry chassis for Glasgow Electricity Committee.

Hurst, Nelson and Co., Ltd., of Motherwell, have received an order for ten new tramway car bodies with covers from Dundee Corporation, at a cost of £1,300 each.

Hull Corporation has given an order to Messrs. Youngs, of Birmingham, for a set of hydraulic lifting jacks for lifting tramcar bodies at £285.

The London County Council has adopted the recommendation of the Highways Committee for the provision of electrical welding equipment for tramway track welding at a cost of £700.

Dick, Kerr & Co., Ltd., are supplying a turbo-alternator condensing plant and transformer at £133,736, to Glasgow Electricity Committee.

The Brush Electrical Engineering Co., Ltd., of Loughborough, have received an order for six bogie type, vestibule front cars and three pairs of maximum traction trucks from West Hartlepool Corporation.

THE
ENGLISH ELECTRIC COMPANY
LIMITED.

Abchurch Yard, Cannon Street, London, E.C.4.

This Company, with a Capital of £5,000,000, has been formed to consolidate under one direction and management the various interests of the following companies, in all of which a predominating control exists :—

COVENTRY ORDNANCE WORKS, LTD.
DICK, KERR & CO., LTD.
PHŒNIX DYNAMO MANUFACTURING CO., LTD.
UNITED ELECTRIC CAR CO., LTD.
WILLANS & ROBINSON, LTD.

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TENDERS INVITED.

COUNTY BOROUGH OF ROCHDALE TRAMWAYS DEPARTMENT.

Contract for Stores.

The Tramways Committee of the Rochdale Corporation invite tenders for the following Stores for the year ended March 31st, 1920: Gears and Pinions, Cast Iron and Malleable Iron Castings, Brass Castings, Iron and Steel, Springs, Ironmongery, Paints and Varnishes, Timber, Overhead Materials, Stationery and General Stores.

Further particulars with form of tender may be had on application to the General Manager, Mr. George Webster, Tramways Offices, Mellor Street, Rochdale, on payment of the sum of 5s. for each form of tender, which amount will be refunded on receipt of a bona-fide tender. Samples can be seen at the Tramway Offices.

Tenders addressed to the Chairman of the Tramways Committee, Tramway Offices, Mellor Street, Rochdale, must be delivered not later than 12 o'clock noon on Thursday, the 13th March, 1918.

The Corporation do not bind themselves to accept the lowest or any tender.

Town Hall. (Signed) WM. HY. HICKSON,
Rochdale, Town Clerk.
February 20, 1919.

MANCHESTER CORPORATION TRAMWAYS.

The Tramways Committee of the Manchester Corporation are prepared to receive tenders for the supply of the following:—

(a) Macintoshes and Sou'westers.
(b) Veterinary Services.
(c) Hire of Bicycles.
(d) Oxygen and Acetylene Gas.
(e) Welding Portions, etc.
(f) Controllers for tramcars,

and GENERAL STORES, as set forth in the undermentioned Schedules, viz:—

SCHEDULE A.
Commutator Segments.
Armature and Field Coils.
Motor Brush-holder Spare Parts.
Controller Fingers, etc.
Lamps, Bells, Cells, etc.
Insulation Material.
Carbon Brushes for Motors.
Overhead Equipment Material.
Trolley Wheel Bushes & Spindles.
SCHEDULE B.
Cable (Power & Lighting) Bell Wire.
Copper & Steel Wire, and Copper Strip.
Galvanised Steel Cable.
SCHEDULE D.
Lubricants, Oils, Motor Spirit, etc.
Soaps, Disinfectants, Metal Polish, etc.
Paints, White and Red Lead, Varnishes, etc.
Methylated Spirits, Shellac, Turpentine, etc.
Transfers and English Gold Leaf.
Ambulance Accessories, etc.
SCHEDULE E.
Plate Glass, Ruby Glass, Common Sheet Glass, etc.
Crucibles, etc.
SCHEDULE F.
Rubber Strip, Goloshes, Gloves, Rubber Tubes, etc.
Rubber Tyres for Motor Vehicles, etc.
Leather Belting, etc.
SCHEDULE G.
Workshop and Permanent Way Tools.
Lamps, Buckets, Cans and Sundry Ironmongery.
Car Brass Furniture.
Re-lacquering Roof Light Frames.
Grinding Blocks, Emery Wheels,
SCHEDULE H.
Iron and Steel Bars and Sheets.
Steel Fish Bolts, Tie Bars.
Bolts, Screws, etc.
Truck and Sundry Springs.
Chains, etc.
Ornamental Fences.
Steel Stampings, Iron and Steel Forgings, etc.
Anti-friction White Metal.
Tinplates.
SCHEDULE I.
Car Axles.
Car Wheel Tyres.
Car Wheel Centres.
Gear and Pinion Wheels.
SCHEDULE J.
Iron and Steel Castings.
Coal and Furnace Coke.
SCHEDULE K.
Paint, Varnish, Cleaning and Stable Brushes,
Sponges, Dusters, Cotton Waste, etc.
Lubricant Pads for Axle Boxes.
Rope, Cord, Lamp Wicks, etc.
Grey Duck, Twill, and Holland.
Lurry Sheets and Sand Bags, etc.
Hampers, etc.
SCHEDULE L.
Portland Cement, Chippings and Broken Stone
Sand, Bricks, Sanitary Fittings, etc.

Schedules, etc., may be obtained on application to Mr. J. M. McElroy, General Manager, Corporation Tramways, 55, Piccadilly, Manchester. Tenders are to be addressed to the Chairman of the Tramways Committee, 55, Piccadilly, Manchester, and must be received not later than 10 a.m. on Tuesday, the 11th March, 1919.

The Committee do not bind themselves to accept the lowest or any tender.

THOMAS HUDSON,
Town Hall, Manchester. Town Clerk.
21st February, 1919.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C. ..	Feb. 11	491	470	— 21	45	23,007	—
Aberdeen Corporation ..	„ 12	2,167	2,390	+ 223	37	96,218	+ 16,023
Ayr Corporation ..	„ 8	329	391	+ 62	38	23,044	+ 4,824
Birkenhead Corporation	„ 16	1,931	1,946	+ 15	46	100,348	+ 15,237
Blackburn „ ..	„ 12	1,453	1,685	+ 232	46½	81,399	+ 12,664
Bradford Corporation ..	„ 15	7,432	8,583	+ 1,151	46	425,575	+ 74,136
Burnley Corporation .	„ 15	1,977	2,596	+ 619	..	..	..
Burton-on-Trent Cor. ..	„ 16	377	382	+ 5	46	18,998	+ 4,097
Bury Corporation ..	„ 16	1,649	1,962	+ 313	46	93,838	+ 18,286
Chatham & District ..	„ 6	1,163	1,086	— 77	5	6,192	+ 208
Cork Electric	„ 6	585	529	— 56	5	2,849	— 143
Derby Corporation ..	„ 15	1,229	1,401	+ 109	46	68,770	+ 12,554
Dundee City	„ 12	1,729	1,949	+ 220	30	76,326	+ 15,152
East Ham Corporation ..	„ 14	1,357	1,531	+ 174	45½	71,950	+ 9,155
Glasgow Corporation ..	„ 15	26,278	26,490	+ 212	37½	1,062,459	+ 82,142
Glossop (U.E. Sup. Co.) ..	„ 15	180	202	+ 22	7	1,431	+ 201
Halifax Corporation ..	„ 11	2,164	2,531	+ 367	45½	128,018	+ 17,441
do. Motor Buses ..	„ 11	53	63	+ 10	45½	3,042	+ 801
Huddersfield Corporation	„ 15	3,309	3,354	+ 45	46	166,643	+ 21,302
Ilford U.D. Council ..	„ 15	789	954	+ 165	46	46,124	+ 11,091
Ipswich Corporation ..	„ 15	614	653	+ 39	46	34,192	+ 3,694
Isle of Thanet ..	„ 15	187	309	+ 122	19½	6,065	+ 2,648
Kilmarnock Corporation	„ 15	211	253	+ 42	39½	10,546	+ 2,394
Lanarkshire	„ 6	3,137	3,480	+ 343	5	20,059	+ 4,125
Leeds City	„ 15	11,373	13,243	+ 1,870	46	622,124	+ 116,662
Leicester Corporation ..	„ 15	4,187	4,743	+ 556	..	..	..
Leyton U.D. Council ..	„ 13	1,862	2,413	+ 551	46	109,160	+ 23,157
Liverpool Corporation ..	„ 15	16,583	18,762	+ 2,179	6½	128,690	+ 20,941
Llandudno & Colwyn Bay	„ 14	242	284	+ 42	11	3,222	+ 707
London County Council ..	„ 19	51,918	64,025	+ 12,107	46½	3,081,229	+ 523,011
Maidstone Corporation ..	„ 13	247	258	+ 11	45½	12,990	+ 1,699
Manchester Corporation	„ 15	23,468	26,500	+ 3,032	46	1,201,767	+ 230,869
Newcastle-on-Tyne Cor.	„ 15	8,593	7,685	— 908	46	408,575	+ 45,790
Northampton Cor. ..	„ 7	923	950	+ 27	45	39,845	+ 1,849
Nottingham Corporation	„ 13	4,824	6,274	+ 1,450	46	264,443	+ 57,919
Oldham Corporation ..	„ 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation ..	„ 12	1,166	1,237	+ 71	45½	59,294	—
Rhondda Tramways ..	„ 6	1,582	1,907	+ 325	5	10,804	+ 2,850
Rotherham Corporation	„ 19	2,002	1,917	— 85	46½	106,062	+ 20,644
Sheffield Corporation ..	„ 16	13,189	12,247	— 942	46½	619,068	+ 49,049
Southampton Cor. ..	„ 12	2,292	2,193	— 99	44½	114,562	+ 19,562
Southend-on-Sea Cor. ..	„ 12	711	1,020	+ 309	46	59,926	+ 19,742
South Shields Cor. ..	„ 4	1,072	1,154	+ 82	40	46,121	+ 7,881
Sunderland Corporation..	„ 16	2,001	2,536	+ 535	46	101,262	+ 15,497
Swindon Corporation ..	Jan. 29	282	282	+ Nil	43½	13,460	+ 1,581
Torquay Tramways ..	Feb. 6	657	608	— 49	5	3,724	+ 308
Tyneside Trys. & Trmrds.	Jan. 22	730	823	+ 93	4	2,655	+ 229
Wallasey Corporation ..	Feb. 15	1,456	1,774	+ 318	45½	86,371	+ 14,278
Walsall Corporation ..	„ 15	1,082	1,202	+ 120	49	57,053	+ 10,850
Walthamstow U.D. Coun.	„ 15	1,186	1,307	+ 121	46	65,947	+ 10,057
Warrington Corporation	„ 6	752	826	+ 74	45	34,954	+ 5,281
West Ham Corporation	„ 13	3,736	4,535	+ 799	45½	209,260	+ 41,944
Wigan Corporation .	Jan. 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Feb. 11	£54,428	£60,269	6	£312,210	— £3,253
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Dec. 8	3,228	3,884	36	30,974	+ 2,168
Brazilian Traction (Mrs.)	Nov.	7,695,000	7,581,000	48	93,363,000	+ 9,232,000
Brisbane	Jan.	34,500	38,575	4	38,575	+ 4,075
British Columbia .. $	Dec.	555,555	691,065	26	3,418,095	+ 494,435
Buenos Aires Lacroze ..	Jan.	38,902	41,556	30	300,780	+ 31,403
Burmah Tram. & Light Rs.	Dec.	26,224	34,593	21	176,539	+ 40,719
Calcutta .. .. Rs.	Feb. 8	72,140	85,090	5½	482,393	+ 61,675
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Jan.	4,011	3,655	4	3,655	— 356
Cordoba	Aug.	14,233	15,734	21	79,054	+ 8,740
East India	Jan.	1,176	1,970	26	11,923	+ 4,474
Hong Kong.. .. $	Dec. 21	13,113	13,866	51	703,608	+ 19,086
Kalgoorlie	Oct.	2,795	2,835	43	27,905	+ 982
La Plata	Jan.	4,711	5,730	4	5,730	+ 1,019
Lima	Nov.	37,249	44,948	48	479,952	+ 82,898
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Dec. 31	46,646	43,146	52	942,232	+ 94,912
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	— 83,959
Manila .. .. $	Nov.	159,000	214,292	48	2,090,630	+ 466,897
Montevideo	Dec.	34,025	38,441	8	70,139	+ 5,054
Pernambuco	Feb. 16	4,927	5,098	6½	35,617	+ 2,426
Peruvian .. .. $	Jan.	1,129,350	1,009,650	30	7,030,365	— 247,255
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Jan.	5,361	6,373	4	6,373	+ 1,012
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore .. .. $	Jan. 4	13,119	14,909	1	14,909	+ 1,790
Toronto .. .. $	Nov.	1,052,000	1,071,106	48	11,716,181	+ 729,183
Winnipeg .. .. $	Nov.	305,881	283,721	48	3,252,863	+ 213,466

WANTED.

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SATURDAY, MARCH 1, 1919.

A MINISTRY OF TRANSPORT.

It is impossible to exaggerate the importance of the Bill establishing the new Ministry of Ways and Communications which was read for the first time in the House of Commons on Wednesday night. Although it was generally anticipated that the Bill would be of a comprehensive character, few were prepared for so colossal a conception as the text of the Bill indicates. This shows that the Ministry is to have power to control railways, light railways, tramways and roads, as well as canals, docks and harbours, and the supply of electricity. The Ministry is authorised to purchase any existing undertaking by a mere Order in Council. Such orders are to lie on the table of both Houses of Parliament for thirty days, and will become operative if neither House within that period presents an address against them. Generally speaking, the Bill will give the Ministry power over every conceivable form of land transport, and it may even acquire steamships and other services carried on as ancillary to the particular business of any transport undertaking. The only qualification to the power of the Ministry to purchase transport undertakings is in the case of municipal tramways, which are not to be acquired except by agreement with the local authority owning them or having an option on them. The profits of the railway companies on the 1913 basis are guaranteed to the stockholders for two years after the termination of the war, and within that period the future policy of the Government towards the railways will be settled. During this period the Minister will exercise great powers, as the companies are required to obey his directions as to rates, fares and charges, salaries and wages, and conditions of employment, the operation or discontinuance of the undertakings, and alterations necessary for the public safety or the more efficient working of the undertakings. The Minister is also given full authority, subject only to the approval of the Treasury, to make advances by loans or grants upon any terms he thinks fit, to any authority, company or person for the construction, improvement, or maintanance of any transport undertaking. The Government have plans for the promotion of great schemes for the development and the supply of electric power for public and private services, and as railways will be the largest users of electricity, and as they provide the cheapest routes for transmitting current at a distance from the generating stations, it has been thought desirable that the work should be under the control of the Transport Ministry. It is, of course, understood that the policy of the Government includes the extensive application of electricity to railway operation. Strong opposition to the measure was foreshadowed from the motor interests, who fear that the inclusion of the control of roads in the Ministry of Transport will retard the development of motor services; but transport is a means and not an end, and it will probably be found that the best use will be made of all methods if development is directed and co-ordinated under a single Ministry. It is the aim of the Government to adopt every expedient to reduce the cost of transport and to extend its benefits to every district in the country. While Sir Eric Geddes, the first Minister, has had a railway career, he is a man of broad views and wide outlook, and under his direction there is little need to fear that the Ministry will be influenced by any partisan claims. The progress of transport has for years been hindered by the chaotic condition created by unchecked competition, and it will be an immense advantage to substitute co-operative effort which will make it possible to avoid waste and secure the best use of all the means available.

EMPLOYEES' DEMAND FOR A 44-HOUR WEEK.

At the conference of representatives of the municipal and company-owned tramways and representatives of the National Transport Workers' Federation, which was held in London on Friday of last week, no progress was made in the negotiations. At the meetings held in Leicester in the preceding week the employers offered to agree to a 48-hour week with payment of wages on the basis of a 54-hour week. This offer was not acceptable to the employees, who demanded the same wages as are now paid for the normal week, which varies in length in different undertakings.

At the meeting in London representatives of the employees renewed their original demand for a 44-hour week, without reduction in wages, and negotiations practically reached a deadlock. It was subsequently arranged that the matter should be referred to the Ministry of Labour, with the explanation of the employers that they could not make further concessions unless they were given full power to increase fares as circumstances might require.

UNDERGROUND EFFICIENCY MEETINGS.

The fifth meeting of the fourth series of efficiency meetings of the operating staff of the London Underground Railways and London General Omnibus Co., Ltd., was held on February 18th, at the L.G.O.C. Training School, Chelsea, Mr. H. E. Blain, operating manager, presiding over an attendance of over 200 members of the central staff of the associated undertakings.

A paper on "Railway Maintenance—Civil Engineering" was read by Mr. Arthur R. Cooper, M.Inst.C.E., Engineer to the Underground Railways, and dealt in an exceedingly interesting and practical manner with the general organisation of the Civil Engineering Department :—practice in regard to permanent way, illustrating types of track, rail fractures, sleepers and fastenings, sanitation and drainage, slips and pumps; electrical equipment of track, including notes on voltage, insulators, cable supports, etc.; signalling, including automatic fogging, lamp signals, speed control, and wireless installations, various types of railway works, including bridges, viaducts, the use of ferro-concrete, and general notes on station maintenance; lighting problems, such as the glare effect, variation in intensty, nature of surrounding surfaces, etc.; the ventilation of tube railways, with some interesting notes on temperature, the piston action of trains, etc.; and a description of new works, such as the Earl's Court flying junction.

The paper was illustrated with a large number of slides, and resulted in an interesting discussion, which was opened by Mr. A. R. McCallum, Chief Assistant to the Railway Mechanical Engineer, and Mr. H. L. Stallan, Maintenance Electrician, Engineering Department, L.G.O.C.

A vote of thanks was accorded to Mr. Cooper, on the motion of Mr. Roger Smith, Chief Electrical Engineer to the Great Western Railway, seconded by Mr. H. E. Roberts, London Divisional Engineer to the South Eastern and Chatham Railway.

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MINISTRY OF WAYS AND COMMUNICATIONS.

On Wednesday the Secretary of State for the Home Department, Mr. Shortt, introduced a Bill to establish a Ministry of Ways and Communications and for the purposes connected therewith. The Bill was brought in by Mr. Shortt, Sir Albert Stanley, Major Baird, and the Attorney General. Mr. Shortt briefly outlined the scope of the measure. No question, he said, was of more pressing importance to the country than that of transport and communication. No industry could be developed unless there were adequate facilities for cheap transport. In the past we have had many means of transport in this country but no co-ordination. We have had no stimulus but that of private gain, with the honourable exception of municipal tramways. The day for unfettered competition had gone. With regard to roads, these were, no doubt, at one time purely local questions but the introduction of the motor has now made them essentially an imperial question, one which could not be dealt with by a large number of local authorities. It was therefore proposed that a Ministry should be set up which would co-ordinate the whole of these important means of transport.

The chief features of the Bill are as follows :—

1. The first proposal is that the Ministry should take control of the railways, light railways, tramways, canals and inland navigation.

2. It is also proposed that roads, bridges, vehicles, and traffic should be included in the Bill.

3. The final power which it is proposed to take is the control of the supply of electricity.

Mr. Shortt admitted that there might be a considerable difference of opinion on the third proposal. He suggested, however, that as transport was the greatest customer for electricity, the House would recognise how important it was that the Ministry should have control of its production and distribution.

In reply to a question Mr. Bonar Law said it was intended to give reasonable time between the introduction of the Bill and the second reading. The text of the Bill was issued on Friday. It is provided that the Minister of Ways and Communications shall have a salary of £5,000 and the Parliamentary Secretary, £1,500.

NATIONAL JOINT TRAMWAY COUNCIL.

The constitution of the National Joint Industrial Council for the Tramway Industry, has now been approved by the constituent associations. These include the Municipal Tramways Association, the Tramways and Light Railways Association, and the National Transport Workers' Federation. The Joint Council will consist of forty-four members, twenty-two being representatives of the employers and twenty-two of the employees. Of the employers' representatives fourteen will be elected from the members of municipal tramway committees and (or)officers of the tramway departments, and eight from the directors and (or) officers of tramway and light railway companies. The members of the Council will retire annually and will be eligible for re-election. The National Transport Workers' Federation have undertaken to secure that all the employees of the traffic staffs and the semi-skilled and unskilled men engaged in other branches of the industry shall be represented on the employees' side of the Council.

MISCELLANEOUS NEWS AND NOTES.

Summer Time.—The Home Secretary has announced that the summer time will be brought into force this year on the morning of Sunday, March 30, and will continue until the night of Sunday, September 28.

Institution of Electrical Engineers.—A lecture on "Dielectrics in Electric Fields," will be delivered by Mr. G. L. Addenbrooke at the meeting of the Institution of Electrical Engineers, which will be held at the Institution of Civil Engineers, Great George Street, Westminster, on Thursday, March 6, at 6 p.m.

Transport Committee at Huddersfield.—A Transport Committee has been appointed by Huddersfield Town Council, with Councillor Hoyle as chairman, and Councillor W. H. Sutcliffe as vice-chairman. A sub-committee has been appointed to ascertain exactly the transport requirements of each department of the Corporation.

Sheffield Tramway Fares.—A mass meeting of workers at Hadfields, Ltd., have passed a resolution protesting against the increase in tramway fares, and urging that a public inquiry should have been held before the decision was taken. It was maintained that the increase would accentuate the housing difficulty.

No Estimates of Cost of Nationalisation.—Mr. Bonar Law in the House of Commons on Tuesday said that no official estimates had been made of the approximate cost of the nationalisation on fair terms to the existing owners of railways, minerals or land in Great Britain.

Conductors' Neglect of Duty.—Ilford tramways manager reports that he has caused a notice to be exhibited, drawing the special attention of conductors to the illegality of taking fares without issuing tickets therefor, to permitiing unauthorised persons to travel free of charge, and to holding lengthy conversations with passengers to the detriment of the service.

Threatened Coal Strike Deferred.—As a result of conferences in London this week, the miners have agreed to defer the date of the notices of the strike from March 15 to March 20, in order to allow the Commission, which has been appointed by Government, time to consider their demands. The miners are to have representation on the Commission equal to one half of the membership.

Wages at Aberdeen.—It has been stated that the wages of the Aberdeen Corporation tramway employees have already been increased by £28,000 a year, and that if the present demands of the employees were granted an additional sum of £63,000 a year would be required, making a total addition to the wages account of £91,000. If the whole proposals of the employees were agreed to, it is anticipated that fares in Aberdeen might have to be doubled.

Liverpool Rolling Stock.—At a meeting of the Liverpool Tramways Committee on February 21, Alderman Russell Taylor presiding, it was decided to order 25 new tramway cars and 30 motor omnibuses. When these vehicles have been obtained, the Corporation will have 600 cars and 70 motor omnibuses. Owing to the increased cost of electric tramway cars, which is now about three times what it was in 1913, the Committee propose to re-fit some of the old cars with new electrical equipment, which will then be serviceable for some years.

Better Ventilation of Cars.—Complaints have been made of the insufficient ventilation of the cars of the Wolverhampton District Electric Tramways, Ltd. Councillor Quilliam at a recent meeting, stated that an improvement was specially required in view of the prevalence of influenza. He thought that the spread of the epidemic was greatly helped by people travelling in the cars, and suggested that the medical officer of health should write to the Tramways Company on the matter.

Collision on the L.C.C. Tramways.—As the result of a collision between a military motor lorry and a London County Council car on February 25, at the junction of Hackney Road and Cambridge Heath Road, the front of the car was smashed, many of the windows were broken and the lorry was badly damaged. A number of passengers in the car received cuts from broken glass, and six persons were removed to the hospital, but were able to proceed home after receiving treatment.

Welcome to Tramway Employees.—The Manchester Tramways Committee propose to give their employees a suitable welcome on their return from the war. About 700 men have now returned and it is expected that before long the number of demobilised tramway men will reach 2,000. The estimated expense to be incurred in the reception amounts to £700. The tramway employees themselves are subscribing £350, the Committee will contribute £250, and the men's Athletic Society £100.

Arbitration on Wages at York.—At a meeting of the Arbitration Committee on February 26 at Old Palace Yard, London, deputations from York Corporation and the Amalgamated Association of Tramway and Vehicle Workers attended in connection with the claim by the latter for the enforcement of the November award against the Corporation for an increase of wages of 25s. a week to the tramway workers. The claim was resisted by the Corporation on the ground that they were not members nor affiliated to the Municipal Tramways Association, and were not parties to the agreement which was made between that Association and the Tramway and Vehicle Workers. The proceedings were conducted in private and the award will be announced at a subsequent date.

Evolution of Tramways.—Mr. F. Bland, of Messrs. Edgar Allen and Company, gave an illustrated lecture on February 24 before the Sheffield Society of Engineers and Metallurgists in the Applied Science Department of Sheffield University, on "The Evolution of the Modern Tramway System." The lecture opened with an account of the earliest attempts at the establishment of a tramway system, commencing with the laying of the lines along the road at the Marble Arch, London, in 1861, and subsequently at Birkenhead. Alluding briefly to the 200 different designs of rails which had been proposed, Mr. Bland showed how these had gradually been reduced to two within thirty years; and then dwelt on the desirability of standardising gauges, cars, etc. In conclusion, he showed various types of the cars now in use on the Continent, in the United States and in the Dominions.

Objection To Numbered Stages.—The General Purposes Committee of Hammersmith Borough Council report that attention has been drawn to the ticket system on the London United Tramways. On the penny stage system, instead of information showing stages on the ticket, numbers only are shown. Having regard to the fact that the fares have recently been raised, the Committee deemed it desirable to suggest to the company that definite information of stages should be printed on the 1d. ticket as in the case of other tickets. The company have replied that the 1d. ticket system referred to is a temporary expedient to tide over the transition of fare alterations, and is due to difficulty with the printers and shortage of pulp. The expedient is not confiend to the Hammersmith area, but covers the whole system, and the company assure the Committee that they intend reverting to the old system.

Accidents at Sheffield.—On February 23, a car ran away at Nether Green terminus during the absence from the platform of the driver. A woman conductor attempted to apply the brakes, but was unsuccessful and the car ran down the steep incline until it reached Hangingwater Road. Here it left the metals and crashed into a branch of the Sheffield and Ecclesall Co-operative Stores, damaging the shop front and then becoming imbedded in asphalte and masonry. The car was practically a wreck. Only two passengers were on board at the time, one escaped without injury, and the other was removed to the hospital together with the conductor, both being badly cut by broken glass. On the same day a single-deck tramcar was proceeding along the Wicker, Sheffield, about 3 o'clock, when a short circuit in the driver's controller caused a flare. The paintwork around was scorched, and one of the windows cracked, but fortunately the driver escaped injury. The flames were quickly extinguished, and the car was able to proceed on its journey.

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Electrification of Edinburgh.—In a report prepared at the instance of the Tramways Committee, Mr. R. S. Pilcher, general manager, of the tramways, supports the recommendations in favour of electrification made by experts consulted by the Corporation at the outbreak of the war. With regard to past objections to overhead wires in Princes Street, Mr. Pilcher suggests that the wires should be erected along the south side and well into the side of the thoroughfare. As to utilising the conduit system in Princes Street he is of the opinion that its adoption would necessitate an alternative route along George Street.

Yorkshire and District Tramway Managers' Association.—A meeting of the Yorkshire and District Tramway Managers Association was held at the Leeds Tramway Offices, on Tuesday, February 11. The following members were present:—Messrs. J. B. Hamilton (Leeds), H. Webber (Keighley), S. Clegg (Lincoln), W. A. Toppin (Chesterfield), A. A. Blackburn (Huddersfield), H. Cordukes (Scarborough), H. Jagger (Rotherham), H. L. White (Grimsby), R. H. Wilkinson (Bradford), W. E. Nicoll (Barnsley), A. Daggett (Leeds), J. W. Galloway (Halifax), W. McGibbon (Mexboro' and Swinton), H. England (Wakefield). Mr. J. B. Hamilton took the chair and extended a hearty welcome to Mr. Toppin, who has succeeded Mr. Acland in Chesterfield, and also to Mr. Blackburn, who has been appointed general manager of the Bradford tramways. An interesting discussion took place respecting the demand for a shorter working week, increased car services, liability of tramways respecting parcels traffic, etc. It was decided to hold meetings quarterly in future, but the honorary secretary was authorised to summons a meeting whenever he thought it advisable

PERSONAL.

Mr. W. J. McCombe, manager of Hull Corporation tramways, has been granted an increase in salary of £200 to £800.

Major H. Clifford Palmer, manager of the publicity department of the General Electric Company, is about to resume duty after an absence on service during the whole period of the war.

Mr. H. C. Lester, who had been with Dennis Brothers, Ltd., of Guildford, for fifteen years, has now accepted a position with Wells and Mayner, Ltd., automobile engineers, of Birmingham.

Sir Sam Fay, general manager of the Great Central Railway, relinquishes his appointment as Director-General of Movements in Railways, at the end of this week. Sir Sam Fay succeeded Sir Guy Granet in this appointment a few months ago.

Mr. Robert B. Holt.—We have to announce the departure of another prominent tramway man from the ranks of municipal officials. Mr. Robert B. Holt, M.I.Mech.E., M.Inst.C.E.I., who has been identified with the Leeds Corporation tramways for many years, has resigned the office of City Highways Engineer and Permanent Way Engineer of the tramways in order to take up an important appointment on the staff of Messrs. C. P. Sandberg, consulting engineers, of Westminster. As announced in our issue of April 11, 1918, Messrs. C. P. Sandberg have developed a process for increasing the life of tramway rails *in situ*, without disturbing the traffic or the pavement. This treatment is now being applied on the Croydon, the Manchester, and the Birmingham tramways. The process will undoubtedly prove of great value to tramways, and Messrs. Sandberg are fortunate in having secured the services of so able and experienced an engineer as Mr. Holt, who not only has special knowledge of tramway track, but who has also for many years devoted much attention to the metallurgical question of steel rails. Mr. Holt collaborated with Messrs. Sandberg in connection with the original experiments both of the Sandberg sorbitic process and the Sandberg *in situ* treatment of rails.

We regret to record the death of **Lieut. Harold Hugh Hirst,** which took place on February 24, at his home, 5, Weymouth Court, Portland Place, London, from pneumonia following influenza. Lieut. Hirst, who was born in 1893, was the only son of Mr. Hugo Hirst, chairman and managing director of the General Electric Company, Ltd. At the time of the outbreak of war he was in France. On returning to England he had a serious illness, but immediately on his recovery in October, 1914, he joined the Inns of Court O.T.C., and in March, 1915, received a commission in the 21st Manchester Regiment. After acting as divisional signal officer to the 30th Division in England, in February, 1916, he proceeded to East Africa with the No. 1 East African Special Visual Signal Company. Owing to malaria and dysentery he was invalided home towards the end of 1916. On recovering from a protracted illness, he was transferred in June, 1917 to the Wireless Service, in which he acted as instructor. He proceeded to France in the summer of 1918, and took his share in the operations preceding the armistice. The strain of the campaign, combined with the effects of gas, broke down his health again, and he was invalided home at the end of October.

CONTRACTS AND ORDERS.

Messrs. Dick, Kerr and Company, owing to an order being cancelled through the armistice, are in a position to promise delivery to Leicester Corporation of a complete 5,000 kilowatt unit in four and a half months at the price of £82,000. This plant is required at the Aylestone Station in order to deal with the extra load for the next two or three years. At the end of that time it is proposed to remove the plant to a new station proposed to be erected at Freeman's meadow, as recommended by Mr. C. H. Wordingham in 1917. Owing to war conditions the Board of Trade refused to sanction an application for a loan to purchase the land, etc., and the Tramways and Electricity Committee intend to recommend the Corporation to renew the application.

Edison Accumulators, Ltd., have an order from Sheffield Corporation for three two-ton electric tipping wagons at £1,304.

Manchester Tramways Committee has accepted tenders for the supply of motor trucks, car bodies and rails to the value of £150,000. At a meeting of the Committee, Alderman Bowes, the chairman, said that fifty cars were to be erected in the sheds, and fifty to be constructed outside as a first instalment.

FINANCIAL.

Carlisle Tramways Company.—The report for 1918 states that after providing for debenture interest and appropriating £1,500 for redemption of second debentures there is a balance at the credit of profit and loss account amounting to £221, which the board recommend should be carried forward. The improvement of just over £2,000 in the receipts was offset by largely increased expenditure.

Leicester Corporation Tramways.—The report for 1918 shows traffic revenue £237,821 (1917, £191,636); other revenue £57,094 (1917, £52,012); total £294,916 (£243,648). Working expenses £218,506 (1917, £172,583); balance £76,409 (1917, £71,065). The car miles totalled, 3,726,462, and passengers 50,983,423. Percentage of working expenses to receipts was 70 per cent.; the average traffic revenue per mile was 15·317d.; average expenses, including power cost, 14·072d. per mile. The sinking fund stands at £255,443, and the amount of reserve or renewals fund is £83,868, on a gross capital expenditure of £933,912. The working expenses, £218,506, were £45,923 over 1917, due to increased charge for power, war bonus to employees, and higher price of materials.

Accounts of the Underground Group.—The report of the Underground Electric Railways Co. for 1918 includes a new statement summarising the results of the associated companies. After providing for expenses the company's income from investment was £760,264 against £606,730 for 1917, and after payment of 5 per cent. for the year on the 6 per cent. income bonds against 4 per cent. for 1917 there remains £36,693 to be carried forward. The income from the London General Omnibus was £179,758 as against £112,033 for 1917. Associated Equipment produced £205,468, compared with £126,000; the London Electric Railway £232,543 against £140,337; the District £76,050 or £41,213 more, and City and South London £45,687, compared with £28,381. Last year's income of the Underground Company was equivalent to 5 per cent. on the total capital. The Associated Equipment Co. took over the manufacturing department of the Omnibus Co. and is the most profitable constituent of the group. It pays 14 per cent. on a million capital and is a bigger source of profit to the Underground than is the Omnibus Company itself. During the year it has been almost wholly occupied in making 3-ton lorries for the Government, but is now at work replacing the company's omnibuses, and manufacturing for general sale.

The Lancashire United Tramways, Ltd.—The ordinary general meeting of the above Company was held at Winchester House, London, E.C., on Tuesday last. The Hon. Sir Arthur Stanley, G.B.E. (Chairman), in submitting the report and balance-sheet to December 31 last, stated that the receipts of the combined undertaking for the year showed an increase of £40,827 and that the expenses had also increased by £25,925. After paying the interest on the company's prior lien and second mortgage debenture stocks, the balance remaining had been placed to renewals or carried forward. The lease of lines held by the New St. Helens and District Tramways Co., Ltd., of which this company holds about 80 per cent. of the capital, expires on September 30 next, the St. Helens Corporation having definitely decided to run the lines themselves. The company has decided to resume the motor coach traffic which was interrupted on the outbreak of war, as from the experience gained during the summer of 1914, there is undoubtedly a great demand for this traffic. The Chairman expressed the sincere sympathy of the Board with the dependants of those employees who have been killed in the war. He also read a letter from Sir Ernest Clarke, Director of the Motor Ambulance Department of the British Red Cross Society, conveying the grateful thanks of his department to the staff and employees of the Company for the generous contributions which they have made to the Red Cross Funds during the period of the War.

THE
ENGLISH ELECTRIC COMPANY
LIMITED.

Abchurch Yard, Cannon Street, London, E.C.4.

This Company, with a Capital of £5,000,000, has been formed to consolidate under one direction and management the various interests of the following companies, in all of which a predominating control exists:—

COVENTRY ORDNANCE WORKS, LTD.
DICK, KERR & CO., LTD.
PHŒNIX DYNAMO MANUFACTURING CO., LTD.
UNITED ELECTRIC CAR CO., LTD.
WILLANS & ROBINSON, LTD.

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FINANCIAL—continued.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Feb. 26, amounted to £67,111, an increase of £1,231 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to February 26 (forty-seven and a half weeks) the total receipts were £3,148,347, an increase of £537,259 on the corresponding period of 1918.

Tramways Light and Power Co.—The report of the Tramways Light and Power Company for the year ended December 31 last, states that the profit amounts to £42,322; £5,277 was brought forward making £47,599. Deducting loan and debenture interest, less tax, £12,396, debenture redemption account, £3,183, and interim dividend on preference shares to June 30, 1918, less tax, £7,107, there is left £24,913. The directors propose a final dividend on preference shares to December 31, less tax, to transfer to reserve fund £12,000, and to carry forward £5,806. As soon as more settled conditions prevail active developments in connection with the power undertakings will be taken in hand.

BUSINESS NOTICES.

S. Smith and Sons (Motor Accessories), Ltd., whose premises at 122, Alma Street, were completely destroyed by fire on the morning of Friday, January 10, have now secured temporary offices at 2, Great Western Buildings, 6, Livery Street (opposite Snow Hill Station), Birmingham, to which address all communications from Birmingham and surrounding districts should be sent.

Coal and Ash Plant.—A new catalogue on "Coal and Ash Plant," issued by Ed. Bennis & Co., Ltd., Little Hulton, Bolton, and 28, Victoria Street, London, S.W.1, consists of 64 pages of text fully illustrated and covers a wide range of application. Owners and managers who want to increase output, reduce costs, eliminate waste and attain the maximum of efficiency in their handling and burning of fuel, will find catalogue suggestive and helpful.

Messrs. Hughes, Bolckow and Company, Ltd., of Blyth, Northumberland, have issued a circular describing the Andrews-Hawksley patent stair treads. These treads can be fitted to iron staircases with cast iron bed risers, or plate risers, or if necessary, they can be made with end lugs for bolting to stringers. The number 2 type, with wrought iron frames fitted with hard wood blocks are four times reversible. The blocks are old seasoned ship oak or battleship teak wood. They provide a non-slipping, silent, unbreakable and fireproof tread. They have qeen largely used by the Admiralty, the War Office and railway companies.

The Equipment and Engineering Company, of 2 and 3, Norfolk Street, London, W.C., have issued four leaflets on electrical arc welding plant. One of these leaflets is illustrated in colour and is intended to show tramway engineers and others interested that the process is so simple that it can be carried out by ordinary labour, while repairs can be effected at small cost, that the saving of scrap parts is considerable, and that the plant can be considered as a paying investment. The illustrations show gear cases, brake hanger links, lever fulcrums, tramway pinions and crossings which have been welded.

Women Conductors Withdrawn at Blackpool.—Women conductors will be released from service by the Blackpool Corporation Tramways in a few weeks. Their numbers have recently been much reduced.

Tramways and Omnibuses.—"The Commercial Motor," to whom tramway undertakings have hitherto been anathema, in a recent issue remarked that the purchase of motor omnibuses "does not necessarily mean the entire superseding of trams, but rather a judicious combination of both, as there is a special sphere of usefulness for each," which is exactly the view we have always taken, and we congratulate our contemporary upon its conversion.

POSITIONS VACANT.

COUNTY BOROUGH OF ROTHERHAM.

Tramways Department.

Rolling Stock Superintendent.

The Tramways Committee invite applications for the above position from fully qualified Mechanical Engineers who have had a thorough experience in connection with tramway work.

Salary £300 per annum (inclusive.)

Applications giving full particulars of experience with copies of testimonials must be received by me not later than 12 noon, March 10, 1919.

Canvassing directly or indirectly will be a disqualification.

Town Hall, Rotherham. CHAS. L. DES FORGES, Town Clerk.

February 18, 1919.

Agencies for Rolling Stock Supplies.

Gentleman is open to take over one or two good agencies in London for rolling stock supplies and accessories, either hard or soft ware. Well versed British and export markets, also sources of supply. Box No. 20, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

NAMES.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C.	Feb. 18	466	473	+ 7	46	23,481	—
Aberdeen Corporation	„ 19	2,134	2,448	+ 314	38	98,666	+ 16,337
Ayr Corporation	„ 22	331	387	+ 56	40	23,828	+ 4,962
Birkenhead Corporation	„ 23	1,943	2,058	+ 115	47	102,406	+ 15,353
Blackburn	„ 19	1,444	1,662	+ 218	47½	83,061	+ 12,869
Bradford Corporation	„ 22	7,987	9,190	+ 1,203	47	434,765	+ 75,339
Burnley Corporation	„ 22	1,957	2,583	+ 626	..	..	..
Burton-on-Trent Cor.	„ 23	370	415	+ 45	47	19,413	+ 4,142
Bury Corporation	„ 23	1,612	1,982	+ 370	47	95,220	+ 18,666
Chatham & District	„ 13	1,227	1,097	— 130	6	7,289	+ 78
Cork Electric	„ 13	604	526	— 78	6	3,375	— 222
Derby Corporation	„ 22	1,257	1,4.3	+ 166	47	70,194	+ 12,721
Dundee City	„ 19	1,537	1,896	+ 359	40	78,223	+ 15,511
East Ham Corporation	„ 22	1,230	1,505	+ 275	46½	73,455	+ 9,430
Glasgow Corporation	„ 22	26,957	27,077	+ 120	38½	1,089,586	+ 82,640
Glossop (U.E. Sup. Co.)	„ 22	188	229	+ 41	8	1,660	+ 242
Halifax Corporation	„ 18	2,279	2,506	+ 227	46½	130,524	+ 17,668
do. Motor Buses	„ 18	52	65	+ 13	46½	3,107	+ 814
Huddersfield Corporation	„ 22	3,577	3,511	— 66	47	170,154	+ 21,236
Ilford U.D. Council	„ 22	745	989	+ 244	47	47,111	+ 11,346
Ipswich Corporation	„ 22	608	658	+ 50	47	34,850	+ 3,762
Isle of Thanet	„ 22	170	274	+ 104	20½	6,339	+ 2,752
Kilmarnock Corporation	„ 22	226	265	+ 39	40½	10,811	+ 2,433
Lanarkshire	„ 13	3,210	3,380	+ 170	6	23,439	+ 4,205
Leeds City	„ 22	11,030	13,464	+ 2,434	47	635,510	+ 119,083
Leicester Corporation	„ 22	4,174	4,812	+ 638	..	..	..
Leyton U.D. Council	„ 20	1,641	2,368	+ 727	47	111,528	+ 23,884
Liverpool Corporation	„ 22	16,667	19,438	+ 2,771	7½	148,128	+ 23,712
Llandudno & Colwyn Bay	„ 14	242	284	+ 42	11	3,222	+ 707
London County Council	„ 26	52,870	67,111	+ 14,241	47½	3,148,347	+ 537,259
Maidstone Corporation	„ 20	232	265	+ 33	46½	13,255	+ 1,732
Manchester Corporation	„ 22	23,546	26,322	+ 3,876	47	1,228,089	+ 233,683
Newcastle-on-Tyne Cor.	„ 22	8,480	7,730	— 750	47	416,306	+ 45,087
Northampton Cor.	„ 21	882	972	+ 90	41	41,749	+ 1,976
Nottingham Corporation	„ 20	4,706	6,202	+ 1,496	47	270,646	+ 59,416
Oldham Corporation	„ 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation	„ 20	1,121	1,309	+ 188	46½	60,603	--
Rhondda Tramways	„ 13	1,591	1,929	+ 338	6	12,733	+ 3,188
Rotherham Corporation	„ 26	2,051	2,071	+ 20	47½	108,133	+ 20,663
Sheffield Corporation	„ 23	13,098	12,347	— 751	47½	631,415	+ 48,299
Southampton Cor.	„ 19	2,176	2,173	— 3	46½	116,736	+ 19,559
Southend-on-Sea Cor.	„ 19	625	1,022	+ 397	47	60,948	+ 20,139
South Shields Cor.	„ 15	1,036	1,131	+ 95	46	52,960	+ 8,689
Sunderland Corporation	„ 23	2,029	2,625	+ 596	47	103,887	+ 16,092
Swindon Corporation	„ 19	286	282	— 4	46½	14,237	+ 1,471
Torquay Tramways	„ 13	653	689	+ 36	6	4,413	+ 344
Tyneside Trys. & Trmrds.	„ 5	848	785	— 62	6	4,238	+ 84
Wallasey Corporation	„ 22	1,458	1,840	+ 382	46½	88,111	+ 14,660
Walsall Corporation	„ 15	1,082	1,202	+ 120	49	57,053	+ 10,850
Walthamstow U.D. Coun.	„ 15	1,186	1,307	+ 121	46	65,947	+ 10,057
Warrington Corporation	„ 20	744	815	+ 71	47	36,572	+ 8,396
West Ham Corporation	„ 20	3,377	4,637	+ 1,260	46½	213,917	+ 43,204
Wigan Corporation	Jan. 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Feb. 18	£53,304	£57,780	7	£36,990	— £1,223
Auckland (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Dec. 8	3,228	3,884	36	30,974	+ 2,168
Brazilian Traction (Mrs.)	Nov.	7,695,000	7,581,000	48	93,863,000	+ 9,232,000
Brisbane	Jan.	34,500	38,575	4	38,575	+ 4,075
British Columbia $	Dec.	655,555	691,065	26	3,418,095	+ 494,435
Buenos Aires Lacroze	Jan.	38,902	41,556	30	300,780	+ 31,403
Burmah Tram. & Light Rs.	Jan.	25,430	38,265	26	214,804	+ 53,554
Calcutta Rs.	Feb. 15	71,419	88,182	6½	570,575	+ 89,819
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Jan.	3,011	3,655	4	3,655	— 356
Cordoba	Aug.	14,233	15,734	21	79,054	+ 8,740
East India	Jan.	1,176	1,970	26	11,923	+ 4,474
Hong Kong $	Feb. 4	12,246	12,854	1	12,854	+ 608
Kalgoorlie	Oct.	2,795	2,835	43	27,905	+ 982
La Plata	Jan.	4,711	5,730	4	5,730	- 1,019
Lima	Dec.	43,198	47,887	52	527,839	+ 87,587
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Feb. 15	37,363	43,299	4	131,355	+ 15,714
Manaos Rs.	Aug.	150,657	132,507	34	1,152,686	+ 83,959
Manila $	Nov.	159,000	214,292	48	2,090,630	— 466,897
Montevideo	Dec.	34,025	38,441	8	70,139	+ 5,054
Para	Jan.	24,060	24,515	8	48,315	+ 940
Pernambuco	Feb. 16	4,927	5,098	6½	35,617	+ 2,426
Peruvian $	Jan.	1,129,850	1,009,650	30	7,030,365	— 247,255
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Jan.	5,361	6,373	4	6,373	+ 1,012
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore $	Jan. 18	12,252	15,842	3	46,068	+ 10,028
Toronto $	Nov.	1,052,000	1,071,106	48	11,716,181	+ 729,183
Winnipeg $	Nov.	305,881	283,721	48	3,252,868	+ 213,466

WANTED.

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SATURDAY, MARCH 8, 1919.

OMNIBUSES AND ROAD MAINTENANCE.

WHEN a Ministry of Ways and Communications comes into existence it will be interesting to know whether it will exercise the power now appertaining to Committees of the Legislature for imposing on omnibus and railless trolley car undertakings a payment of three-eighths of a penny per car mile towards road maintenance. This tax has to be paid by municipal undertakings when running beyond their own boundaries, but, with one exception, no Act has been passed to authorise placing such a burden upon company-owned enterprises. The exception relates to the Act obtained by the Middlesex County Council for the construction of the Great West Road, although the clause was opposed by motor omnibus interests. Before the latter measure was enacted the Government of the day had promised to set up a Committee to consider the question of contributions by omnibuses, etc., but the proposal has not been carried into effect. It is not likely therefore that Parliamentary Committees sitting during the present session will depart from established practice. That being so, the action of the London County Council, in securing the withdrawal of the Highways Committee's proposal to pay the statutory sum on account of the omnibuses which they are seeking powers to run within and without the county boundary, is not likely to influence Parliament. The Highways Committee's proposal was framed in a novel manner, and it would apparently permit the ⅜d. contribution to be paid to their own tramway fund and to other tramway undertakings, both public and private. No other conclusion can be drawn from the wording of the provision as given in another column of this issue. Evidently the Committee had no intention to offer the payment to all road authorities alike, for their proposal reads, "such contributions to accrue in moieties to the road authority and tramway authority in respect of mileage run in thoroughfares along which tramways are in operation." On the whole the Committee were wisely advised in withdrawing the proposal to pay any contribution at all, and when the Bill comes on for hearing, their counsel no doubt will set up the plea that in London special circumstances demand that no contribution should be levied. The reason, of course, is that the omnibus companies pay nothing, though in their case there will be an exception when they come to use the Great West Road. If the Parliamentary Committee decide against the Council their action is not unlikely to lead to an agitation by some of the borough councils and railway companies for a similar tax to be imposed on all omnibus undertakings in the Metropolis. The only satisfactory solution of the problem will probably be found to be more liberal grants for road maintenance from the Treasury.

L.C.C. TRAMWAY MATTERS.

In view of the importance which the electricity question has assumed, the Council on Tuesday, at the last meeting, approved the recommendation of the Highways Committee that the return relative to London's electricity supply, which was issued annually previous to the war, should now be revived, and that the figures should be prepared for the year 1917-18. The gap of three years in the information would be filled by such figures as become available in the Statistical Abstract for London.

SHORTAGE OF CARS.—There is at present a serious shortage of cars available for service, and the Highways Committee explained the circumstances. The present time-table requires 1,244 electric cars (amounting, with 20 per cent. spares, to 1,493 cars) and 114 trailers (amounting, with 5 per cent. spares, to 120 cars). On February 20th, 1919, only 1,049 electric cars and 114 trailers were in service; there being, therefore, 195 electric cars short of immediate needs. The total numbers of cars held by the Council are 1,662 electric cars and 158 trailers, so that the electric cars out of service for repairs exceed 600—approximately 40 per cent. of the total number. The shortage from present time-table requirements has developed during the past few weeks, as a result principally of an unexpectedly large number of breakages of axles. During 1914—when the average number of cars in service was larger than now—only 127 axles broke. During the short period from January 1st to February 12th, 1919, the number of axle breakages was 288. The rate was particularly high during the recent frosty weather, and the high average during this period is attributed partly to the overloading of cars under present conditions at times of heaviest traffic, and partly to the depreciated condition of the rolling stock, as a result of the heavy use to which it has been subjected over nearly five years—in which period abnormal conditions caused by the war have made it impossible to maintain the former high standard in connection with car repairs and renewals. Every effort is being made to overcome the present car shortage. With regard to axles, if the promises made by the various contractors are fulfilled, the position will be relieved by the middle of March. During the war many cars have had to be depleted of available parts unobtainable from outside sources to replace broken or worn-out parts on service cars. The manufacture—practically discontinued during the war, except for munition purposes—of malleable iron and steel castings and forgings is being resumed, but, as all undertakings are pressing for the same materials, delivery is slow. Stores and equipment of all kinds, required for maintaining cars in serviceable condition, continue in short supply. The time within which it will be possible to meet the present time-table requirements depends on the rate at which supplies of these commodities are obtainable.

PAY OF DISTRICT FOREMEN.—The resolution settling the classification of district foremen in the permanent way branch of Nov., 1918, was rescinded. It was agreed that the pay of district foremen, including foremen of point adjusters, in the permanent way branch should be 70s. a week, rising by annual increments of 5s. a week to a maximum of 90s., and in one special case to 100s. a week. A petition having been received from the foremen, charge hands and inspectors at the central car repair depot, asking for increased pay, it was agreed that the weekly rate of foremen in the rolling stock branch, other than those employed in the car sheds, should be from £3 10s. to £5, the weekly rate of charge hands in the rolling stock branch £2 10s. to £3 5s., and for inspectors at the central repair depot £2 10s. to £4.

TRAFFIC SUPERINTENDENTS.—The scheme for the reorganisation of the tramways department approved on February 20th, 1917, provided for the appointment of a traffic operating superintendent at a commencing salary of £500. On February 19th, 1918, the Council fixed the salary at £600, rising to £800 a year, with the provision that the appointment might, if necessary, be made at other than the minimum salary. The position has since been advertised, but owing to the Military Service Acts, it was not considered desirable to make an appointment, and temporary arrangements were made. The reorganisation scheme also fixed two positions of divisional traffic superintendents. The one for the northern section was filled permanently on February 19th, 1918, by the appointment of Mr. E. Cloney, and Mr. J. Terry was made acting divisional traffic superintendent of the southern

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section, at £350 a year, which he was then receiving as district traffic superintendent. The Highways Committee now recommended that Mr. Terry, who is 65 years of age, be appointed traffic operation superintendent for a period not exceeding one year, at his present salary, with the addition of an acting allowance at the rate of £100 a year, as his retirement at the present time would cause inconvenience. As regards the position of divisional traffic superintendent (southern section), the Committee recommended the appointment of Mr. S. R. Geary, at present an assistant in the tramways department, at a salary of £300, increasing to £400 by annual increments of £25, as provided under the scheme of reorganisation. The recommendations were agreed to.

THE SHORTAGE OF STORES AND MATERIALS.—The Highways Committee reported that in the present stringency available supples are secured by undertakings possessing the greatest facilities for effecting immediate purchases and making the greatest efforts to locate available supplies. The General Manager had advised the Committee that unless he had greater facilities for obtaining supplies he saw no prospect of making a greater number of cars available. Under the present practice of inviting tenders and dealing with them, opportunities of obtaining supplies are frequently lost owing to the unwillingness of contractors to quote except for immediate acceptance. The Committee are at present authorised to obtain otherwise than by advertisement, and to accept tenders for tramway stores and equipment to the value in respect of any purchase of £250. The Committee now recommended that temporary arrangements be made at once in order to facilitate the acquisition of stores and materials. The proposal would be effective up to October 31st, 1919, when they would have under review the whole position in regard to tramway stores, including information as to the present facilities of the general manager for the purchase of coal, timber, and metals and manufactured articles of fluctuating value.

The Council adopted the recommendations of the Committee that the general manager should be authorised to invite tenders or quotations for specified quantities or short period supplies, that until the resumption of the weekly meetings of the Council the Committee should be authorised to open such tenders where the estimated expenditure exceeds £500; that the general manager be authorised to open such tenders where the estimated expenditure is £500 or less, and to accept any such tender or quotation provided that his action be reported to the Committee in a form showing separately (1) tenders or quotations resulting from competition, (2) quotations invited from one firm only in each case, (3) unsuccessful invitations of tenders or quotations, and (4) orders placed on emergency without tenders or quotations having been invited.—The report was adopted.

THE COUNCILS OMNIBUS SCHEME—The adjourned report of the Highways Committee recommending that Parliamentary powers be sought in the ensuing session to run auxiliary motor omnibuses in connection with the Council's tramways undertaking was again submitted.

Mr. H. H. Gordon had given notice to move the reference back of the report having regard to the undesirability of imposing taxation on traffic. This, however, was not moved, as Mr. Hume withdrew the following recommendation:

"To provide that from the revenues of the omnibus undertaking contribution be made at the rate of three-eighths of a penny per omnibus mile towards the cost of road maintenance, such contribution to accrue in moieties to the road authority and tramway authority in respect of mileage run in thoroughfares along which tramways are in operation."

Thereupon the recommendation to apply for statutory power was agreed to by the necessary statutory majority without a division.

INCREASED FARES.

At a meeting of the Hull Tramways Committee, it was intimated that fares would soon be increased. The 1d. fares would have to be raised to 1½d. The Committee have not yet recommended the increase, but it is evident that they are only putting off the decision for a time. During the last five years, owing to the halfpenny, fares, a sum of £50,000 has been lost.

Colne Town Council have adopted the recommendation of the Tramways Committee that a 1d. fare be charged for a half-mile stage, and 1½d. for a mile stage. The other fares will remain as at present, with the exception of the 3½d. fare, which is to be increased to 4d. Children's fares will be ½d. for a half-mile stage, 1d. for two miles, 1½d. for three miles, and 2d. for the full journey.

Mr. C. J. Spencer, general manager of the London and Suburban Traction Company, Ltd., which controls the London United, the Metropolitan Electric, and the South Metropolitan Electric Tramways, has stated that since January 1st, when the fares were raised the receipts had increased, but in no way proportionate to the increase in expenses. If the new demand for a 44-hour week were granted, the company would find themselves in a very difficult position. Unless the public paid considerably more—possibly a minimum fare of 2d. or 2½d.—the tramway service might have to be discontinued. The burden of the additional expense must fall on the users.

In spite of the increased revenue, Aberdeen Corporation Tramways are showing a considerable loss. The convener of the Tramways Commitee declared that halfpenny fares would have to be abolished at once.

Treasury Notes Found in a Tramcar.—A London County Council tramway conductor recently found a packet containing £500 in Treasury Notes in his car.

MISCELLANEOUS NEWS AND NOTES.

Parcels Delivery at Leeds.—The collection and delivery of parcels by the Leeds City tramways department have been extended throughout the system.

Northampton Tramway Service.—The Sunday service of cars was resumed at Northampton on March 2. The first car leaves the centre of the town at 9.45 a.m., and the last car at 10 p.m.

New Cars for Southampton.—Southampton Corporation, as will be seen from an advertisement in this issue, are inviting tenders for ten standard tramway cars.

Ways and Means.—An interesting first issue is that of "Ways and Means," Mr. Ernest J. P. Benn's new weekly. Among the contributors are the Right Hon. J. R. Clynes, the Right. Hon. J. H. Whitley, M.P., Sir Daniel Stevenson, and Sir George Paish.

Electric Welding. A paper on "Electric Welding and Its Application" will be read by Mr. W. L. Lorkin at the Royal Society of Arts at 4.30 p.m. on Wednesday, March 12. Sir R. A. Hadfield will preside.

Sunderland Industrial Council.—Sunderland Tramways Committee has convened a special meeting for March 10 to discuss the question of setting up an Industrial Council as provided in the constitution of the Industrial Joint Council for the Tramway Industry.

Increased Cost of Current at Sunderland.—Sunderland Tramways Committee has agreed to pay an extra ¼d. per unit for current supplied by the Corporation electricity department, making the cost 1¾d. per unit. This will increase the yearly cost for power by about £1,200.

Sailors Entertained at Portsmouth.—The Mayor of Portsmouth, Mr. J. Timpson, gave 150 Japanese and 50 British seamen a twenty-mile excursion by tramway car to Horndean and back on March 3. He subsequently entertained the party to tea at the Town Hall and afterwards at the Hippodrome.

Claim for Road Damages.—Middlesex County Council are supporting a claim the Metropolitan Tramways Company (Limited) is making to the Ministry of Munitions for between £10,000 and £15,000 compensation for damage caused to the Edgware Road by the heavy and constant traffic of the Ministry of Munitions of the War Department.

Nottingham Extensions Postponed.—Nottingham Corporation is seeking an extension of time for another twelve months, to August 15, 1920, in which to extend the tramway lines to Beeston. The high price of materials and labour renders the scheme impracticable at the present time, but the Corporation still hope to carry out the work.

Free Passes for Edinburgh Councillors.—Edinburgh Town Council by a majority of 20 to 18, have adopted the recommendation that free tramway passes should be granted to each member of the Council. It was originally proposed that councillors should pay £3 3s. per annum for season tickets, but the Council decided that this was not sufficiently generous.

Influenza Among Tramway Employees.—On February 26 ninety-one Belfast motormen and conductors were unable to take duty owing to influenza. A large proportion of the post-office staff was also affected. Leeds tramway employees have suffered heavily, the average daily number of absentees having recently been about 160. In many other towns large numbers of men have been absent from duty owing to the same cause.

Motor Omnibus Service for Birkenhead.—Birkenhead Corporation have a scheme for linking up the north and south ends of the town by a service of motor omnibuses and for this purpose ten single deck omnibuses have been ordered. It is expected that by Whitsuntide sufficient vehicles will have been delivered to enable a service to be run between Park Station and Rock Ferry. Powers were obtained before the war to run a motor omnibus service to several of the outlying townships.

Electric Welding Plant for Dundee.—The Dundee tramways department have purchased an electric welding plant, and representatives from several tramways recently witnessed experiments with it. The plant, which was supplied by the Equipment and Engineering Company, of 2 and 3, Norfolk Street, London, W.C., will be used for rail repair and rail welding, and it is expected to reduce the cost by about one quarter. The plant will also be of great service, of course, in repair work in the car sheds.

Purchasing Agents of Indian Railways.—H.M. Trade Commissioner, Calcutta, has forwarded a list of the London offices of the various railways in India through whom purchases of stores are made, together with the names of the consulting engineers in London, and also of the officials who are empowered to purchase smaller stores in the United Kingdom. The list contains all the more important lines in India, and it may be consulted on application to the Department of Overseas Trade.

Employees' Demands.—The adjourned conference of the Municipal Tramways Association, the Tramways and Light Railways Association, and the National Transport Workers' Federation met at Birmingham on Friday, February 28, to consider further the application for reduced hours and alterations in conditions of employment. Mr. T. B. Goodyer, manager of Croydon Corporation Tramways, presided. The meeting was held in private and a long discussion took place, but it was stated that no substantial progress had been made. A sub-committee was appointed to make further inquiries, and to report to an adjourned meeting which was held in Manchester yesterday. As mentioned in a previous issue the whole facts of the situation are being placed before the Ministry of Labour.

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Extensions at Mansfield.—In his remarks at the annual meeting of the Mansfield and District Light Railway Company, the chairman said that in order to enable the company at the proper time to take advantage of the important colliery developments occurring in the neighbourhood of Rainsworth and Clipstone, the directors were carefully studying the situation with a view to the possible extension of the tramway system. They would be prepared to act as soon as they considered the developments were sufficiently advanced to justify action.

Overhead Trolley System for Edinburgh.—The Sub-Committee of the Edinburgh Town Council, to whom was remitted the report of the general manager (Mr. R. S. Pilcher) on the future arrangements for the construction and development of the tramways, has decided to recommend that the cable system be abolished as soon as practicable after the tramways are taken over by the Corporation at the end of June next, andthat the overhead trolley system be introduced generally, leaving special parts of the city to be considered separately. The Sub-Committee recommends that plans should be prepared at once, and that the first route to be dealt with should be that from Pilrig to Liberton. The Sub-Committee further recommends that the Corporation should acquire a number of motor omnibuses with a view to running them both within and without the city boundaries as supplementary to the tramway system.

PERSONAL.

Mr. E. H. Bond, general manager of Dover Corporation tramways has been granted a war bonus of £25.

Mr. A. J. Waddell, of Birmingham, has been appointed shift engineer at Stuart Street station of Manchester Corporation.

Mr. H. H. Gordon has been returned unopposed to the London County Council as one of the Progressive members for the Whitechapel and St. George's division.

Mr. T. Owen, traffic superintendent of the East Ham tramways department, has been granted an increase in salary to £250 per annum.

Mr. E. Sedgwick, of Rochdale, has been appointed depot superintendent of Southport Corporation tramways, at a salary of £250 a year.

Mr. C. D. Flint, who for many years has been advertising manager of the Edison-Swan Electric Company, has now started business as advertising agent at 190, Fleet Street, E.C.

Mr. S. L. Pearce, chief engineer and manager of Manchester Corporation electricity department, has been granted an increase in salary from £1,500 to £2,000 per annum. **Mr. W. E. Foden,** financial superintendent, has been granted an increase from £500 to £600 per annum.

Mr. P. F. Sullivan, at a meeting of the Institution of Civil Engineers of Ireland on March 3 read a paper on "Tramway Curves and Special Work." The paper was accompanied with plates of various forms of curves, which were dealt with from a geometrical and mathematical point of view.

Mr. W. Clough, who recently resigned the general managership of Bury Corporation tramways department, in order to accept an important position in the paper manufacturing industry, has been presented by the chief officials with a silver tea set as a mark of their appreciation of his services to the Corporation for twenty-six years.

Major Henry Mattinson, R.E., A.M.Inst.C.E., Chief Civil Engineer, Manchester Corporation Tramways, has recently arrived home from Syria on demobilisation. Major Mattinson joined the East Anglian Field Company R.E. (T.) in 1915. After a period as Adjutant and subsequently as Superintendent of Instruction in Bridging to the Western Command R.E. Training Centre, he proceeded to Egypt, where he was appointed Construction Engineer to the Light Railways Directorate E.E.F. He was responsible for the construction of about 100 miles of 60 cm. and 2 ft. 6 in. gauge railways to various points in the front line, of which a line 20 miles in length due north from Jerusalem and over most wild and rocky mountainous country was constructed at the rate of three-quarters of a mile per day. After the successful advance of the Army from September, 1918, Major Mattinson carried out the restoration of the captured Turkish railways to Haifa, Deraa, Damascus, Beirut and Aleppo, some 500 miles in length, considerably destroyed by the retreating forces, and had the satisfaction of completing this work before being demobilised. All tramway officials will realise that much work awaits his attention in Manchester, where, in addition to the restoration of the existing lines, there is a big scheme of reconstruction of the system to undertake, as reported in our issue of September 13, 1917.

FINANCIAL.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Mar. 5 amounted to £68,629, an increase of £15,581 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to March 5 (forty-eight and a half weeks) the total receipts were £3,216,976, an increase of £552,840 on the corresponding period of 1918.

City of Oxford Electric Tramways.—The directors recommend a dividend at 4 per cent. for the year 1918. The gross profit for the year amounted to £10,454. After deducting debenture interest and amount transferred to sinking fund for redemption of debentures, etc., there is a balance of £6,234, or, including £2,035 brought forward, £8,269. £5,000 has been allocated to depreciation on motor omnibuses and char-a-bancs, and after the payment of dividend, £685 is carried forward.

Dublin and Blessington Steam Tramway Co.—A dividend of 5 per for the year ended December 31, 1918, has been declared on the Baronial Guaranteed shares.

Hull Corporation Tramways.—The chairman reported at the last meeting of the Tramways Committee that the rough balance-sheet for the financial year showed a total revenue of £234,770 and an expenditure of £224,757, leaving a balance of £10,018. He considered that very satisfactory considering the enormous expenditure they had been put to. They were paying £40,000 a year more in wages than they did before the war. The total capital invested is £600,000, and on this the profit was £10,000. For the last five years they had lost £50,000 in halfpenny fares.

CONTRACTS AND ORDERS.

Dick, Kerr and Co., Ltd., are supplying a 1,500 h.p. motor and switchgear to Hull Electricity Committee.

W. T. Glover and Co., Ltd., have an order from Salford Electricity Committee for 700 yards of cable at £497 3s. 2d.

Salford Tramways Committee have ordered 72 lifeguard cradles from Mr. Joseph Bowring, of Manchester, at £144.

The British Westinghouse Electric and Manufacturing Company are supplying gear cases to Salford Corporation tramways.

The Rail Welding Company, of 119, Victoria Street, London, S.W., are the successful tenderers to Salford Corporation for welding and re-treading 400 joints by the company's electrical process. The value of the contract is approximately £1,000.

Supply of Tramway Materials.—The London County Council have approved the recommendation of the Highways Committee for the invitation of tenders from selected firms for the supply of cable magnet leads, field coils and press-spahn, plough lead and gear and pinion wheels.

Sorbitic Treatment of Rails at Bournemouth.—Mr. I. Bulfin, general manager of Bournemouth Corporation tramways, has received a quotation from Scholey and Company, Ltd., for the application of the sorbitic treatment of rails at the price of £1 per yard of single track. The manager has reported to the Committee that this treatment is estimated to increase the life of the permanent way by 50 per cent., and he proposes to experiment on a mile of single track at a cost of £1,760. The Committee approved the plan, and the work will be commenced without delay.

POSITIONS VACANT.

MUNICIPAL TRAMWAYS ASSOCIATION.

Appointment of General Secretary.

Applications are invited for the position of Secretary to the above Association.

The gentleman appointed will be required to devote the whole of his time to the duties of the office. Requisite office accommodation and staff will be provided. Salary according to qualifications and experience, but in any case not less than £750 per annum.

Applications, stating age, experience and qualifications, should be forwarded to the undersigned not later than Monday, the 24th instant.

Tramway Offices,
32, Blackfriars Street,
Salford.

G. W. HOLFORD.
Hon. Secretary.

Assistant Estimator.

Wanted for Rolling Stock Works in Midlands, Assistant Estimator, capable of preparing estimates and tenders in detail for various classes of stock; also Assistant Buyer having up-to-date knowledge of best source of supply for materials required in Rolling Stock construction.

Particulars of age, experience, salary required, and when at liberty, to Box No. 21, The TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.

THE
ENGLISH ELECTRIC COMPANY
LIMITED.

Abchurch Yard, Cannon Street, London, E.C.4.

This Company, with a Capital of £5,000,000, has been formed to consolidate under one direction and management the various interests of the following companies, in all of which a predominating control exists:—

COVENTRY ORDNANCE WORKS, LTD.
DICK, KERR & CO., LTD.
PHŒNIX DYNAMO MANUFACTURING CO., LTD.
UNITED ELECTRIC CAR CO., LTD.
WILLANS & ROBINSON, LTD.

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PRICE LIST OF TRAMWAY AND OMNIBUS SHARES.

Dividends Prev.	Dividends Last.	Name.	Paid.	Price, July 27, 1914.	Cash Mar. 6 or previous.	A Week Ago.
5%	5%	Alabama Traction 5% 1st Mt. ..	—	67	69½	71½
2/9	2/9	Anglo-Argentine 5½% 1st Pref.	5	4⅞	71/3	72/6
2/9	2/9	Do. 5½% Cum. 2nd Pref. ..	5	4½	65/-	67/6
4%	4%	Do. 4% Deb.	100	91	67½	68½
4½%	4½%	Do. 4½% Deb.	100	98½	70½	70
5%	5%	Do. 5% Deb.	100	96	70	69½
—	—	Associated Omnibus Co., Ord. ..	5/-	3/32	1/2	1/2
6d.	1/-	Auckland Elec. Trams. Ord. ..	1	1 5/32	19/-	19/-
5%	5%	Do. 5% 1st Mt. Deb. ..	100	102½	87½	87½
7%	7%	Barcelona Trac. 7% Pr. Lien ..	100	—	107½	107½
—	1/-	Bath Electric Trams Pref. Ord.	1	¼	3/5	3/5
6d.	6d.	Do. 5% Cum. Pref. ..	1	3/16	10/-	10/-
4½%	4½%	Do. 4½% 1st. Mort. Deb. ..	100	72½	67	69½
4½%	4½%	Birmingham Dist. Pwr. and Tract. Co. 4½% 1st Deb. ..	100	84½	71½	72½
28/-*	14/-*	Bombay Elec. Sup. & Tram Ord.	10	14	23 5/16	23 15/16
6/-	6/-	Do. 6% Cum. Pref. ..	10	11½	10 13/16	10 13/16
4½%	4½%	Do. 4½% Deb.	100	96	76½	75½
5%	5%	Do. 5% 2nd Mt. Deb. ..	100	100	89	89
$1	$1	Brazilian Trac. & Power Ord. ..	$100	66	53	54
$1½	$1½	Do. 6% Cum. Pref. ..	$100	97	90½	93
4/-	4/-	Brisbane Elec. Trams. Ord. ..	5	7½	5	5
2/6	2/6	Do. 5% Cum. Pref. ..	5	5	81/3	81/3
4½%	4½%	Do. 4½% 1st Deb. ..	100	101½	94	94
8%	8%	Brit. Col. Elec. Ry. Def. Ord. ..	100	107	41	41
5%	5%	Do. Pref. Ord.	100	106	43	44
5%	5%	Do. 5% Cum. Pref. ..	100	103	63½	64
4½%	4½%	Do. 4½% 1st Mt. Debs. ..	40	99½	83½	83½
4½%	4½%	Do. 4½% Perp. Con. Deb.	100	96½	62	61
£8*	£8*	Brit. Elec. Trac. Ord.	100	—	48½	48½
6%	6%	Do. 6% Cum. Part. Pref.	100	—	80	79½
5%	5%	Do. 5% Deb.	100	92	85½	84½
4½%	4½%	Do. 4½% 2nd Deb. ..	100	77½	68½	68½
5%	5%	B. A. Lacroze 5% Mt. Deb. ..	100	100	74½	74½
5/6	2/6	Calcutta Tramways Ord. ..	5	7½	7	7 1/16
2/6	2/6	Do. 5% Cum. Pref. ..	5	5 1/16	81/3	80/-
4½%	4½%	Do. 4½% 1st Deb. ..	100	99½	71½	72
1/-*	1/-*	Cape Elec. Trams.	1	1/16	15/1½	15/1½
1/3	1/3	City of B. A. Trams	5	5½	81/3	82/-
4%	4%	Do. 4% Deb.	100	97½	71½	71¼
5%	5%	Colombo Elec. Tram. & Ltg. Co. 5% 1st Mort. Deb.	100	95	80	80
5%	5%	Co. F.C. do. Jardin Botanico 5% 1st Mort. Bds.	100	93½	80½	79½
5%	5%	Costa Rica Elec. Lt. & Trac. Co. 5% 1st Deb.	—	63½	57½	57½
5/-	4/-	Dublin United Trams. Ord. ..	10	8	8½	8½xd
6%	6%	Do. 6% Pref.	100	—	105	105
—	—	Hastings & Dis. Elec. Tram Ord.	10/-	1/16	1/6½	1/6½
1/2½*	1/2½*	Do. 6% Cum. Pref. ..	1	9/16	10/9	10/9
4½%	4½%	Do. 4% Deb.	100	67½	60½	60½
8½d.	7d.	Hong Kong Tramway	5/-	9/16	23/6	23/6
5%	5%	Do. 5% Deb. ..	100	87½	98½	98½
2/6	3/-	Isle of Thanet 5% Pref. .	5	2½	29/4½	28/9
4%	4%	Do. 4% Deb.	100	73½	—	—
5%	5%	Kalgoorlie Trams 5% A. Deb. ..	100	84½	—	—
—	—	La Plata Trams. Ord.	1	½	2/6	2/6
9/6	7/-	Lanarkshire Trams Co.	10	10½	£10/9/3	£10/9/3
5%	5%	Lancs. Un. Trams 5% Pr. Ln.	100	85½	77	77
5%	5%	Lisbon Elec. Trams 5% Mt. Debs.	100	95	71	71
7½d.*	10½d.*	Llandudno & Colwyn B. Ord.	1	—	12/4½	12/4½
--	1½d.	London & Sub. Traction Ord. ..	1	3/32	3/3	3/3
6d.	6d.	Do. 5% Pref.	1	5/16	7/9	7/9
4½%	4½%	Do. 4½% 1 Mt. Deb. ..	100	75½	58	58
4½%	4½%	L.G.O. 4½% 1st Deb.	100	100	83½	82
5%	5%	Do. 5% Inc. Deb... ..	100	88½	76	76½
4%	4%	Lon. Unt. Trams. 4% 1st Mt. Db.	100	55	41	42
3/-	3/-	Madras Elec. 6% Pref. ..	5	5 1/16	84/6	84/6
5%	5%	Do. 5% Deb.	100	100	86	86
7½d.%*	9½d.*	Manaos Trams & Ltg. Ord. ..	1	3/32	4/6	4/6
5%	5%	Do. 5% 1st Deb.	100	77	67½	67½
$1½	$1½	Manila Elec. R. R. & Light ..	$100	102	93	93
4½%	4½%	Met. Elec. Trams. 4½% Deb. ..	100	85½	73½	74
5%	5%	Do. 5% Deb.	100	87	77½	77½
$1½	$1½	Mexico Trams. Common ..	$100	70	48½	48
5%	5%	Do. 1 Mt. 5% G.B. ..	—	84	62	62½
—	—	Do. 6% Mt. Bds. ..	100	76	52½	53½
4½%	4½%	Montreal Trys. Co. 4½% Stg. Dbs.	100	100	95½	95½
5½%	4½%	Do. 4½% Stg. Debs. (1922)	100	99	96	94½
2/-	1/2½*	National Steam Car	1	15/32	16/10½	17/-
9½d.*	9½d.*	New General Traction	1	½	7/6	7/6
8½d.	6d.	Northern Gen. Trans. Ord. ..	1	21/32	14/1½	14/1½
4/-	3/-	Para Elec. Rlys. Ord.	5	4½	£6/7/3	5½
5%	5%	Do. 5% 1st Deb. ..	100	89½	81	79
—	—	Pernambuco Tram. & Power Ord	1	—	7/9	8/3
—	8½d.	Do. 7% Non. Cm. Part Pf.	1	—	16/-	16/-
5%	5%	Portland Ry. 5% 1st Mt. 30 yr.	—	96	—	—
8½d.*	8½d.*	Potteries Elec. Trac. Ord. ..	1	11/32	9/10½	9/6
6d.	6d.	Do. 5% Pref.	1	15/32	11/-	11/9
8d.	1/4	Provincial Trams. Ord.	1	½	17/7	17/7
3/-	3/-	Rangoon Tram. 6% Cum. Pref.	5	5½	82/6	82/6
5%	5%	Rhondda Trams. 5% 1 M. Deb.	100	88	79½	77½
5%	5%	Rio de Janeiro Try. & Pr. 1st Mt. 30 yr. 5% Gld. Bd. '35 ..	—	97½	93	92
5%	5%	Do. 1st Mt. 5% 50 yr. ..	100	89½	81	80½
5%	5%	Sao Paulo Deb. 5% 1st Mt. ..	$500	99	93½	92
5%	5%	Do. 5% Perp. Deb. ..	100	99½	80½	80½
15/-	10/-	Shanghai Elec. Cons.	10	13	14 11/16	14 13/16
3d.	3d.	Singapore Elec. Trams. ..	5/-	½	5/-	5/-
4%	4%	Sou. Met. Elec. Tram & Ltg. 4% Db	100	66	54	54
5%	5%	S. Elec. Trams. of B.A. 5% Mt. ..	—	100½	99¾	99¾
4½%	4½%	Toronto 1st Mt. 4½% Bds. ..	100	98	94½	94½
4½%	4½%	Tramways (M.E.T.) Omnibus 4½% Debs.	100	91	75	75
2/-	2/-	Un'd. El. Tr. Monte Video Ord.	5	4½	48/9	48/9
4½%	4½%	Winnipeg El. 4½% Deb. ..	100	94½	69	69
—	—	Yorks (W.R.) Elec. Trams. Ord.	5	½	27/6	27/6
8/-	8/-	Do. 6% Cum. Pref. ..	5	½	8[illegible]/9	81/3
4½%	4½%	Do. 4½% 1st Deb.	100	85	73	73
—	—	Metropolitan Dist. Ord. ..	100	21½	24	25½
—	—	Undgd. Elec. Rys. of London ..	10	21½	67/6	67/6
		Do. "A"	1/-	½	9/6	9/10½
4½%	4½%	Do. 4½% Bds. of 1933 Rd.	—	99	103½	104
6%	6%	Do. 6% 1st. Cum. In. Db.	100	114	101½	102½
4%	4%	Do. 6% In. Bonds Rd. ..	—	85	93	6½

* Indicates dividend for the year. In other cases the dividend is for the half-year

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

Names.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C. ..	Feb. 25	443	449	+ 56	47	23,980	—
Aberdeen Corporation ..	„ 26	2,172	2,438	+ 266	39	101,104	+ 16,603
Ayr Corporation ..	Mar. 1	331	396	+ 65	41	24,224	+ 5,017
Birkenhead Corporation	„ 2	1,916	2,039	+ 123	48	104,445	+ 15,475
Blackburn „ ..	Feb. 26	1,473	1,766	+ 293	48¾	84,828	+ 13,183
Bradford Corporation .	„ 22	7,987	9,190	+ 1,203	47	434,765	+ 75,339
Burnley Corporation .	Mar. 1	1,932	2,577	+ 645	..	..	..
Burton-on-Trent Cor. .	„ 2	373	396	+ 23	48	19,809	+ 4,165
Bury Corporation ..	„ 2	1,572	1,915	+ 343	48	97,735	+ 19,009
Chatham & District ..	Feb. 20	1,090	1,143	+ 53	7	8,432	+ 131
Cork Electric	„ 20	587	532	— 55	7	3,907	— 277
Derby Corporation ..	Mar. 1	1,232	1,416	+ 184	48	71,610	+ 12,906
Dundee City	Feb. 26	1,588	1,980	+ 392	41	80,203	+ 15,903
East Ham Corporation ..	Mar. 1	1,291	1,543	+ 252	47¾	74,999	+ 9,688
Glasgow Corporation ..	„ 1	26,825	28,444	+ 1,619	39½	1,117,980	+ 84,177
Glossop (U.E. Sup. Co.) ..	„ 1	174	212	+ 38	9	1,872	+ 281
Halifax Corporation ..	Feb. 25	2,215	2,632	+ 417	47½	133,157	+ 18,086
do. Motor Buses ..	„ 25	50	67	+ 17	47½	3,174	+ 831
Huddersfield Corporation	Mar. 1	3,134	3,642	+ 508	48	173,796	+ 11,743
Ilford U.D. Council ..	„ 1	762	1,016	+ 254	48	48,140	+ 11,604
Ipswich Corporation ..	„ 1	626	666	+ 40	48	35,625	+ 3,899
Isle of Thanet ..	„ 1	162	320	+ 158	21¾	6,659	+ 2,910
Kilmarnock Corporation	„ 1	213	263	+ 50	41¾	11,074	+ 2,482
Lanarkshire	Feb. 20	3,314	3,374	+ 60	7	26,813	+ 4,365
Leeds City	Mar. 1	11,124	13,996	+ 2,862	48	649,577	+ 121,790
Leicester Corporation ..	„ 1	4,218	4,859	+ 641	..	..	..
Leyton U.D. Council ..	Feb. 27	1,722	2,482	+ 760	48	114,010	+ 24,644
Liverpool Corporation ..	Mar. 1	16,890	19,767	+ 2,877	48	167,894	+ 26,589
Llandudno & Colwyn Bay	Feb. 21	249	288	+ 39	12	3,510	+ 746
London County Council ..	Mar. 5	53,048	68,629	+ 15,581	48½	3,216,976	+ 552,840
Maidstone Corporation ..	Feb. 27	246	278	+ 32	47¾	13,533	+ 1,765
Manchester Corporation	Mar. 1	23,517	26,143	+ 2,626	48	1,254,232	+ 236,121
Newcastle-on-Tyne Cor.	„ 1	8,577	8,140	— 437	48	424,446	+ 44,623
Northampton Cor. ..	Feb. 28	960	979	+ 19	48	42,728	+ 1,995
Nottingham Corporation	„ 27	4,868	6,424	+ 1,556	48	277,070	+ 60,972
Oldham Corporation ..	Mar. 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation ..	Feb. 27	1,145	1,324	+ 179	47¾	61,927	--
Rhondda Tramways ..	„ 20	1,560	1,999	+ 439	7	14,733	+ 3,627
Rotherham Corporation	Mar. 5	1,901	2,054	+ 153	48¾	110,188	+ 20,817
Sheffield Corporation ..	„ 2	12,854	12,558	— 296	48¾	643,973	+ 48,002
Southampton Cor. ..	Feb. 26	2,252	2,350	+ 98	47¾	119,086	+ 19,657
Southend-on-Sea Cor. ..	„ 26	644	1,112	+ 468	48	62,060	+ 20,107
South Shields Cor. ..	„ 15	1,036	1,131	+ 95	46	52,960	+ 8,639
Sunderland Corporation..	Mar. 2	2,031	2,742	+ 711	48	106,629	+ 16,802
Swindon Corporation .	Feb. 26	288	290	+ 2	47¾	14,526	+ 1,472
Torquay Tramways .	„ 20	657	628	— 29	7	5,041	+ 315
Tyneside Trys. & Trmrds.	„ 5	848	785	— 62	6	4,238	+ 84
Wallasey Corporation .	Mar. 1	1,473	1,886	+ 413	47¾	89,987	+ 15,063
Walsall Corporation ..	Feb. 15	1,082	1,202	+ 120	49	57,053	+ 10,850
Walthamstow U.D. Coun.	Mar. 1	1,128	1,393	+ 265	48	68,646	+ 10,534
Warrington Corporation	Feb. 20	744	815	+ 71	47	36,572	+ 8,396
West Ham Corporation	„ 27	3,592	4,743	+ 1,150	47¾	218,660	+ 44,355
Wigan Corporation .	Jan. 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

Name.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Feb. 25	£54,377	£58,997	8	£428,987	— £5,843
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Jan. 5	4,505	4,504	40	35,478	+ 2,167
Brazilian Traction (Mlrs.)	Nov.	7,695,000	7,581,000	48	93,363,000	+ 9,232,000
Brisbane	Jan.	34,500	38,575	4	38,575	+ 4,075
British Columbia .. $	Jan.	559,569	677,489	30	4,095,584	+ 612,355
Buenos Aires Lacroze ..	Jan.	38,902	41,556	30	300,780	+ 31,403
Burmah Tram. & Light Rs.	Jan.	25,430	38,265	26	214,804	+ 53,554
Calcutta .. .. Rs.	Feb. 22	72,650	87,371	7¾	657,946	+ 104,540
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Feb.	2,031	2,351	8	6,006	— 2,036
Cordoba	Aug.	14,233	15,734	21	79,054	+ 8,740
East India	Jan.	1,176	1,970	26	11,923	+ 4,474
Hong Kong.. .. $	Feb. 4	12,246	12,854	1	12,854	+ 608
Kalgoorlie	Oct.	2,795	2,835	43	27,905	+ 982
La Plata	Feb.	4,746	5,698	8	11,428	+ 1,971
Lima	Dec.	43,198	47,887	52	527,839	+ 87,587
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Feb. 15	37,363	43,299	4	131,355	+ 15,714
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	+ 83,959
Manila .. .. $	Nov.	159,000	214,202	48	2,090,630	— 466,897
Montevideo	Feb.	34,573	38,772	17	149,821	+ 14,147
Para	Jan.	24,060	24,515	8	48,315	+ 940
Pernambuco	Feb. 23	4,438	4,879	7¾	40,496	+ 2,867
Peruvian .. .. $	Jan.	1,189,350	1,009,650	30	7,030,365	— 247,255
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Jan.	5,361	6,373	4	6,373	+ 1,012
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore . .. $	Jan. 25	12,356	14,320	4	60,388	+ 11,992
Toronto .. .. $	Jan.	1,068,319	1,106,840	4	1,106,840	+ 38,521
Winnipeg .. . $	Jan.	334,642	390,539	4	390,539	+ 55,897

WANTED.

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THE Tramway & Railway World
WITH MOTOR TRAFFIC SECTION

Founded 1892. LONDON, MARCH 13, 1919. VOL. XLV.

NATIONALISATION OF TRANSPORT AND ELECTRICITY SUPPLY.

A TITANIC SCHEME FOR THE UNIFICATION AND CHEAPENING OF COMMUNICATION.

The possibilities which underlie the Government's Bill for the establishment of a Ministry of Ways and Communications (which was ntroduced in the House of Commons on February 26, and the full text of which appears in this issue), can only be described as immense. At first glance the generality, not to say vagueness, of the text might lead one to suppose that there was not such a very great deal in it as the promises of the Government led the public to expect. The word "nationalisation" does not figure in the measure at all. But as the reader studies the text carefully, the more he knows about the present and past of means of transportation in this country and of the laws governing it, the more he will realise that this apparently simple Bill is a proposal for a legislative revolution. In its ultimate effect the scheme is likely to be as far-reaching as any single proposal ever submitted to Parliament. The aim in view—namely, enormously to improve and cheapen transport facilities and electricity supply—commands general approval. In regard to methods and details there will be considerable difference of opinion. The almost incalculable possibilities involved will doubtless be fully brought out in the detailed examination which the Bill is receiving both inside and outside of Parliament. Meanwhile, it may be said generally that it is an "enabling" Bill, and the things which it enables the Minister of Ways and Communications to do suggest the adjectives, so often misapplied but here truly descriptive, of Herculean or Titanic to describe the labours which lie in front of Sir Eric Geddes.

The Minister, in the first place, has imposed on him the duty of improving means of locomotion and transport, and there is to be transferred to him all powers and duties of any Government department in relation to railways, light railways, tramways, canals, roads, bridges and ferries, and vehicles and traffic thereon, harbours, docks, and piers, and the supply of electricity. With a view to affording time for the formulation of future policy, the Minister will for two years control railways, tramways, and other means of locomotion. After that, the remaining provisions of the Bill are enabling. The King may by Order in Council authorise the Minister to purchase and work railways, tramways, etc., to establish and work similar undertakings, and to lease them. Price, failing agreement, is to be fixed by arbitration. Any such Order in Council must lie on the table of Parliament for 30 days, and if either House presents within that period an address to the King against it, no further proceedings shall be taken on it. The Minister may make advances to authorities or companies for construction, improvement, or maintenance of means of transport. That is the whole substance of the Bill, and yet it is enough.

It may be observed that there are no authoritative recommendations, of recent date at least, from any Government Commission or Committee in favour of railway nationalisation, nor in the case of tramways has the subject ever been mooted. Here, however, is where the "enabling" nature of the Bill comes in. Orders in Council may be made for such purposes, but there is to be a period of two years from the passing of the Bill during which the Minister may take possession of railways, canals, tramways, and harbours, and during which he is to consider and formulate a policy for the future position of the undertakings. Various investigations can take place during that period, but a time limit is put upon them.

The Minister may for the two years take over the possession and control of the railways now exercised by the Government and also of other railways, and of light railways, tramways, canals, and harbours. The directors, officers, and servants of any undertaking so controlled are to obey the directions of the Minister as to the user thereof in regard to many specified matters which taken together give complete control. The Minister may by Order authorise the owners to acquire land and construct works. Another remarkable feature is that any rates, fares, etc., directed by the Minister shall be deemed to be reasonable notwithstanding any statutory provisions.

THE ORDERS IN COUNCIL.

There may be much criticism of the proposal that the purchase of railways, etc., by the Minister can be authorised by Orders in Council. The question of the advisability of any particular purchase is thus removed from the direct control of Parliament, except that the latter can by resolution annul an Order during the 30 days when it is lying on the table. Experience shows, however, that it is a very rare thing for such an annulment to be brought about, as the Government of the day naturally support the Order. Moreover, such discussions in the House of Commons usually come on late at night after ordinary business is disposed of. They are accordingly perfunctory, and they take place at such an hour that they cannot be reported in the morning newspapers, so that there is little publicity. The opposition to this arrangement may be one of the dangerous rocks in the path of the Bill.

As to the cost of purchase, the Treasury may issue securities to meet it. The financial aspects of this transaction form another topic for serious discussion. When an undertaking is acquired or established, the Minister, unless he leases it, is to operate it in the national interest, and is to be entitled to fix such rates, fares, etc., as he thinks fit, notwithstanding any statutory limit. What would existing railway or

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tramway authorities think if they were given such powers? Quite evidently the Government have in view the future demands of labour, and the general public are to pay.

The possibility of the continuance in the hands of companies or municipalities of undertakings is not barred, and hence interest attaches to the power of the Minister to make advances to authorities or companies for construction, improvement, or maintenance.

Municipal Tramways.

A notable variation in the power to purchase tramways is made in the case of tramways owned by local authorities. The Order in Council shall not authorise the Minister to purchase these except by agreement, nor to purchase without the consent of the local authority any tramway which a local authority, under Section 43 of the Tramways Act, 1870, are entitled to purchase. While there seems good reason to believe that under the Bill a nationalised system of railways, harbours, docks, and canals is possible, it does not appear that such a result is so likely in the case of tramways unless the local authorities change their attitude. The ownership and operation of tramways has come to be regarded as such an essential part of the functions of municipalities that it hardly seems likely they will consent to State ownership and operation. In any case, the advantages which would arise from a nationalised tramway system would, for some time at least, be less remarkable than those expected to come from unified control and operation of the railways, which by junctions form one big system.

Events may, however, so shape themselves that the municipalities will see the wisdom of coming into line. There might then be unified control and operation of large tramway systems, each of which is at present owned by several authorities. Advantages both as to efficiency and economy would be secured, for example, if all the tramways in the metropolitan area, or in South Lancashire and West Yorkshire, were under unified control. Further, the Minister is given powers which will facilitate extensions, and the linking together of adjacent undertakings. Great developments in this way should be possible under the Bill, but it is quite certain they will take time. It will be when questions of policy, initiation of schemes, and the selection of the best with an eye to the general benefit arise that difficulties will begin. It wi l be then also that enterprise, wise judgment, foresight, knowledge of traffic conditions, and power to reconcile conflicting local prejudices will have the opportunity of showing their qualities. There is no specific provision in the Bill for the repeal of the restrictive provisions of the Tramways Act, 1870, as to the veto of local authorities, etc., but apparently that is what is contemplated.

The municipal tramways opposition to the Bill may be bought off by the exception above referred to, but on the other hand unification of tramway control in given areas may be delayed.

Roads.

The Bill of course does not propose that the Minister should buy roads, doubtless because no one has a monopoly of the use of a public road, nor is there a charge for using it. But existing powers of Government departments in regard to roads are to be transferred to the Minister. This applies also in the case of bridges and ferries, and vehicles and traffic thereon. Advances may be made for construction and maintenance.

The most determined opposition has been threatened by the automobile interests to the proposal to give to the Minister such powers over roads and traffic upon them. They contend that there should be a separate Minister for roads, that railway interests are antagonistic to road interests, and that under the Bill the road users will suffer. When one remembers the hostile, not to say bellicose, attitude through the years of its existence of the automobile world towards railways and tramways, such a position is not surprising. The road motor business, whether for the carriage of passengers or goods, is in a highly privileged position as regards permanent way, and it is no doubt the fear that that position will be placed on a more equitable basis which lies at the bottom of the hostility. Should motor vehicle owners, however, get their way, there would be a serious breach in that co-ordination of all forms of transport which the country has a right to expect, and, indeed must have. Motor traffic ought to be brought into the scheme, and be regulated in relation to all other kinds of traffic, just as those other kinds are to be regulated as between themselves.

Sir Eric Geddes,
Minister of Ways and Communications.

Electricity Supply.

Perhaps the most novel part of the Bill is that relating to electricity supply. During last year we had the reports of the Coal Conservation Committee of the Ministry of Reconstruction, the Board of Trade Electric Power Supply Committee, and other official bodies in favour of the establishment of a great national electric power supply, with the object of providing a cheap and abundant supply of power for all purposes all over the country. At the general election in the end of the year Ministers spoke strongly in favour of such a development. In introducing the Ways and Communications Bill on February 26, the Home Secretary (Mr. Shortt) said that the measure provided for taking over the control of the supply of electricity. He justified this control being in the hands of the Minister of Ways and

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Communications as transport is the greatest and most permanent customer for electricity, and just as the increase of the use of electric power by manufacturers would raise output, so would the traffic on the railways increase. He might also have pointed out that extensive railway electrification is hoped for under the Bill.

When one comes, however, to examine the Bill, very little is to be found on the subject. The first statement on the point is that the supply of electricity is one of the matters in regard to which the powers and duties of any Government department are to be transferred to the new Minister. The power of control for two years of railways, tramways, etc., does not include electricity supply. Neither does the power to purchase undertakings specify electrical undertakings, nor are they mentioned in the list of subjects towards the development of which the Minister may make advances. In fact, the only other reference to electricity in the Bill is contained in Clause 6, which provides that it shall be the duty of the owners of any railway, tramway, canal, inland navigation, dock, harbour, pier, or electricity undertaking, and the authority liable to maintain any road or bridge, to furnish to the Minister such accounts, statistics, and returns as he may require.

The solution of the matter lies in the fact that the Board of Trade are preparing a Bill to deal with electric power supply. This measure will be based on the recommendations of the committees referred to above, and it is understood that when the necessary executive and administrative bodies have been constituted the general control will be placed under the Minister of Ways and Communications.

SIR ERIC GEDDES.

Sir Eric Geddes, who is to be the first Minister of Ways and Communications, has had a varied and important career. He is only 43 years of age, having been born of Scottish parentage in India in 1876. Entering railway service, he rapidly rose to important positions. The Rohilkund and Kumaon Railway and the Baltimore and Ohio Railway gave him positions which were stepping-stones to his appointment as deputy general manager of the North Eastern Railway. When the war had been going on for a year or two Mr. Lloyd George began a wise policy of selecting for important posts in the Government, and also in administrative work, men of outstanding ability in various walks of life. The need for railway development and communication behind the British lines in France became very urgent, while at the same time the strain on the railway system at home was specially severe. So it came about that in 1916 Sir Eric Geddes was appointed Director-General of Military Railways and Inspector-General of Transportation. Doubtless it was because of the faculty which he showed as an organiser that in the following year he was appointed First Lord of the Admiralty, a position which he held till the end of the war. Sir Eric being the holder of one of the most important posts in the Government, it became advisable that he should be a Member of Parliament, and a seat was found for him at Cambridge, which he represents in the Unionist interest. In the new Government which came into office after last general election Sir Eric Geddes took the place of a Minister without portfolio, and it was speedily announced that he would be appointed Minister of Ways and Communications as soon as that office was created. It is reported that he has already done much preliminary work in connection with his new office. Having previously relinquished his position on the North Eastern Railway, he is free to devote himself to the great task which lies before him.

RAIL CREEP AND EXPANSION.

By E. Capone.

In undertaking the construction, maintenance, or electrification of railway permanent way one of the problems claiming consideration is the provision that has to be made to prevent as far as possible troubles arising from the creeping of the track rails and to arrange the mechanical side of the work in such a way that the inevitable expansion and contraction may take place without causing an element of danger to traffic. In the case of creeping we have to deal with an unknown quantity as regards to the amount of movement, but the direction in the case of flat-footed track rails is pretty certain; with conductor rails the movement is quite uncertain, as it has been observed both against traffic and up a grade. Track rail creep is to a great extent checked by anchoring and using cross stays, but in the case of conductor rails the creep is checked by concrete anchor blocks connected to the conductor rail through strain insulators (Fig. 1); on short lengths a simpler and less expensive way is adopted (Fig. 2). Both the methods illustrated have been found from practical experience to be reliable and effective.

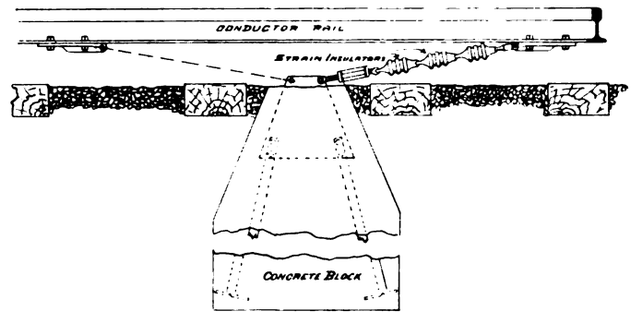

Fig. 1.—Anchor for Conductor Rails up to Half Mile Lengths.

With expansion and contraction we are dealing to some extent with a known factor, and in taking a 32 in. movement in a mile of rail for a variation of 80 deg. Fahr. we have something to work on. In the assembly of lengths of rail shims are applied between each length; to permit of this various thicknesses of shims are used, depending on the temperature at the time of assembly. Expansion must not be restricted and provision should always be made for the concertina action which takes place. Ends and joints must be flexible to absorb this movement, otherwise distortion of the rail will be the result.

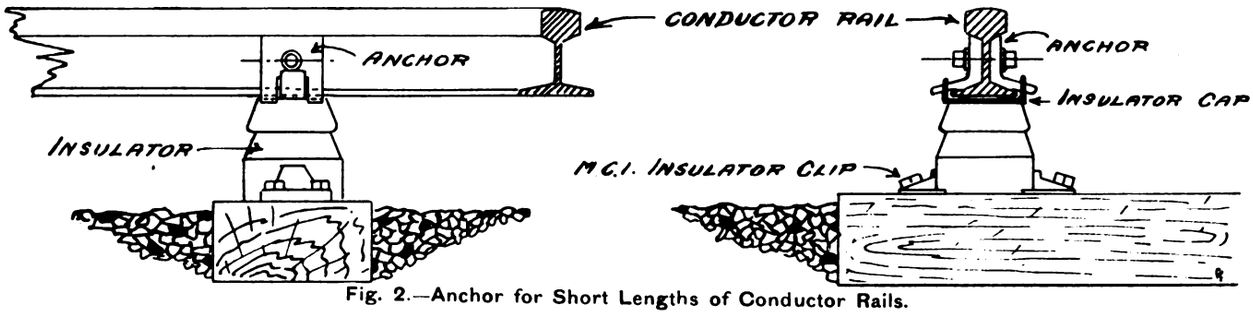

Fig. 2.—Anchor for Short Lengths of Conductor Rails.

It is a difficult matter to separate or exactly define to what extent creeping is due to the constant expansion and contraction which takes place. One point of interest has been observed, namely, that with a rising temperature the tension set up in the rails is released by the vibration of a train passing, and a cracking sound is observed due to the give at joints.

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The elongation produced at the latter is generally ahead of the train. This can easily be accounted for when it is considered that the train acts as an anchor weight on the rails, and the expansion given at the joints tends to thrust the rail forward or away from oncoming trains. An impressive statement as to the extent of rail creeping is made in Mr. Tratman's book, where it is stated that a movement of 42 ft. in one month has been found to take place on the Eads arch bridge over the Mississippi River. The method of dealing with such conditions is here shown diagrammatically in an illustration. The rail cannot be held against such a strain, and is therefore allowed to move; in order to permit this, switches are placed as shown, and the rail lengths as they move past the switches on the left-hand side are taken off and put on the right-hand end, thus allowing a constant movement of the rail (Fig. 3).

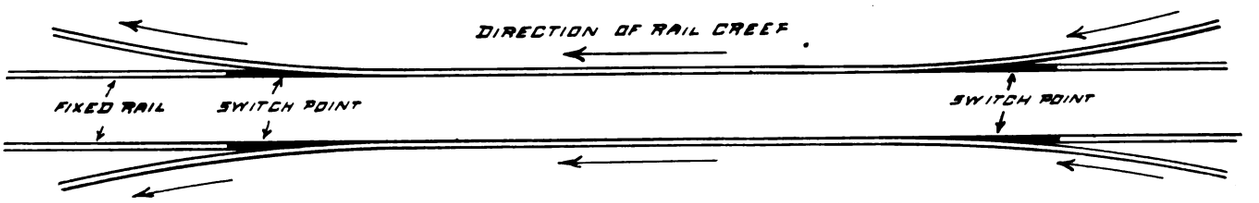

Fig. 3.—Diagrams Showing Arrangement to Allow Creep of Rail.

The three principal factors influencing rail creepage are traffic, climate, and road bed. For certain foreign lines the localities being devoid of stone, the soil is soft, and stone has to be imported, but it naturally follows that such conditions are not comparable with lines put down where suitable soil for the road bed and ballasting is plentiful. A soft or elastic road bed assists creep, since the train can be considered to be travelling in a hollow or depression formed in the track by its own weight. An illustration of a train starting and braking at a station, and a diagrammatic indication of the effect produced on the rail (Figs. 4 and 5), is here given. A train pulls itself along by means of the rails having a tendency to elongate or stretch the rail in front and to thrust or to compress the rail behind. When the train is coming to a standstill, or braking, the reverse action takes place. The exact value of the respective forces cannot be estimated, but the result can be observed, and to show a typical case an illustration is given which has been taken from actual observations of rail movements and distortions of sleepers (Fig. 6). The two inside rails are practically stationary; it is only the outside rails which move in the direction of the traffic. The fact that the inside rails do not move is due to the counteracting forces being in juxtaposition, and also owing to the anchoring effect of special work at crossovers and junctions, etc., for it is only on these inside rails that the cross-tying and fixing of special work is placed, the outside rails are seldom broken in such a way as to be held. On newly laid road beds, where the latter have not been shaken down and are of a more

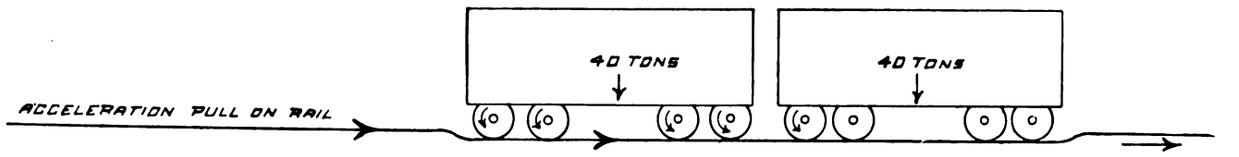

Fig. 4.—Track Deflection and Pull Due to Starting.

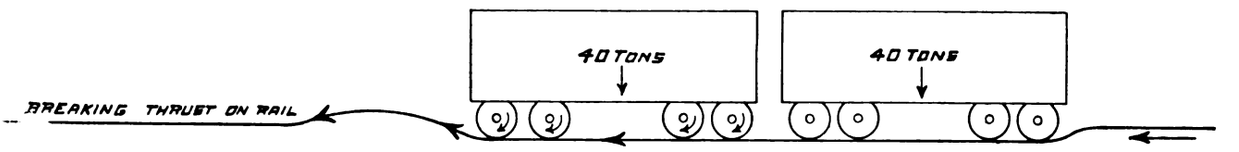

Fig. 5.—Track Deflection and Thrust Due to Braking.

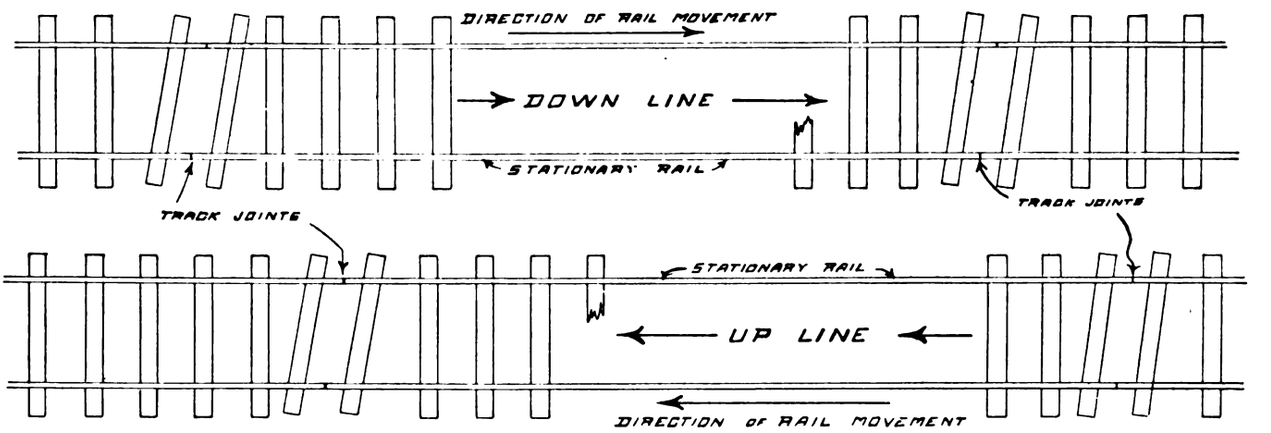

Fig. 6.—Plan of Tracks Showing Rail Movement.

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springy nature, the depression caused by a train is greater, and the wave, as it were, that is produced in front of the train gives a greater creeping effect, but after a time it is observed that with repacking and ballasting the movement of rails is not nearly so noticeable. The creeping, as the illustration shows, is only observable at the joints of the track; this is owing to the fishplates being slotted to take a dog-spike, which is driven into the sleepers on each side of a joint. Each joint therefore acts as an anchor, and the movement of the rail pulls the sleepers along with it, as shown. There are several methods of anchoring sleepers, and one usually adopted is by the use of cross ties of band iron about 2 in. by ½ in. by 10 ft. long, bolted to the sleepers so as to hold the joint sleepers in position; two methods in use are shown on the illustration (Fig. 7), one with the tie-bars placed diagonally and the other with the bar run parallel with the rail and placed on the outside. In the latter case it is bolted to the two joint sleepers, and attached to the three others as an anchor. These methods are especially adapted to the Vignoles type of rail, which rests direct on and is spiked to the sleepers.

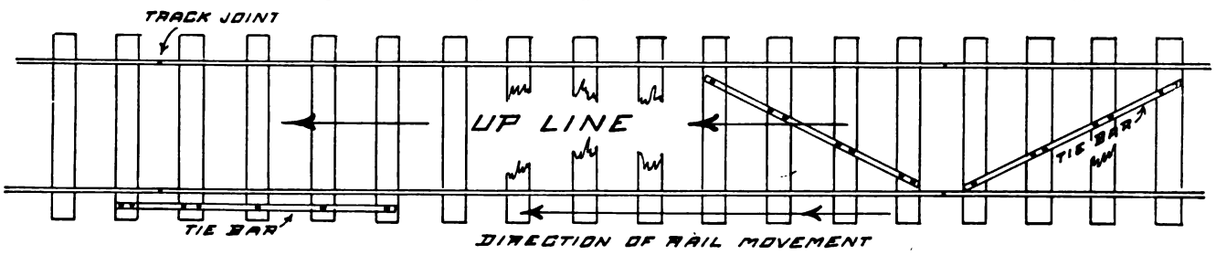

Fig. 7.—Method of Anchoring Sleepers.

It may be of interest in this connection to show the test results taken to ascertain the creeping taking place on a conductor rail. Fig. 8 is a typical diagram, giving a record over about eleven weeks at temperatures varying 28 deg. Fahr. It will be observed, as before mentioned, that no definite movement can be looked for, and it is only by observation that the extent and direction can be ascertained. The diagram shows that the rail in one case moves 10½ in. with the traffic on a down grade, and in the other length of rail it moves 6¾ in. against the traffic on an up grade of 1 in 100. It is on account of this uncertainty that the rail is anchored in the middle of its length to withstand a pull in either direction; only one anchor is used, and the length of rail not allowed to exceed, say, half a mile. Being anchored in the middle, the ends are free to move in and out, and allowance for this expansion is made at the ends of the conductor rail to give clearances for rolling stock. The conductor rail is not subject to the complex conditions prevailing on the track, and one might reasonably look for more definite or reliable movements, but the movements are erratic and difficult to analyse.

The track rails are practically anchored at every sleeper, but the conductor rail rests on insulators, allowing for every flexibility, hence the presence of entirely different features. The pull on a long length of conductor rail has on several lengths gone up to 8 tons, but this is again a very variable quantity. In theory expansion is allowed at each joint, and the bonds are formed for flexibility and certain movement, but in practice to allow for flexibility at joints means that those near the anchor are either in a constant state of tension or under constant compression. The rail always crowds up in one direction, and is held by its weight. The nicety of adjustment at each joint is impossible under the strain always produced by the tendency of the rails to creep along.

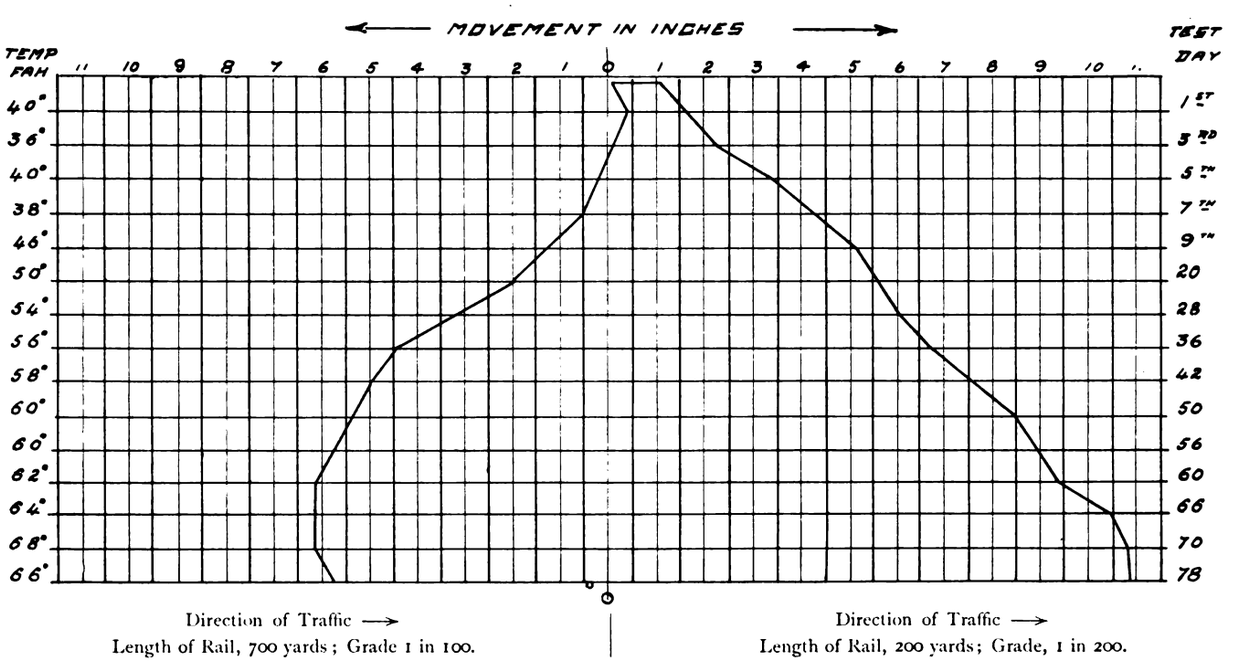

Fig. 8.—Typical Record of Conductor Rail Movement.

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PLIGHT OF CAIRO ELECTRIC CARS AFTER A NILE DELUGE.

EXTRICATED BY BRITISH TROOPS.

The recent deluge in the Cairo district had a deplorable effect on a number of electric railway cars at Cairo which were standing in a depot or siding situated on low lying land outside the city. The rush of the water brought with it an avalanche of sand, with the result that when the flood had receded the cars were embedded in sand to a height in some places of about half way up the side windows. British troops joined in the work of freeing the rolling stock, and they had a by no means light task, for in places the sand was two feet above the height of a man. Two photographs on the following page indicate in a striking manner the condition of the cars just after the deluge had subsided, and show the arduous character of the work of extrication.

Prior to the war the electric cars were a great convenience to visitors to Egypt, but during the past four and a half years this traffic had almost entirely disappeared, for Egypt has been a base for British military expeditions during almost the whole of that period. First there was the Gallipoli campaign, then the defence of the Suez Canal against the attempted invasion of Egypt by Turks and Germans; finally there was the British and Arab advance, which ended in the freeing of Palestine from the Turkish yoke. Several hundred thousand troops from Great Britain and Ireland (drawn from the Old Army, the Territorial Force, including the Yeomanry, the New Army, Australia, and Canada) have stayed for various periods in Egypt, and a large number encamped in the vicinity of Cairo. Many thousands were also treated in hospitals which had to be put up to deal with the wounded. The military visitors brought a record traffic to the railways and tramways. Electric cars traverse the principal thoroughfares of the city, and also run for considerable distances into the country. Nearly all the street tramway routes in Cairo start from or pass through the Esbekiyeh Gardens, where the theatre is situated.

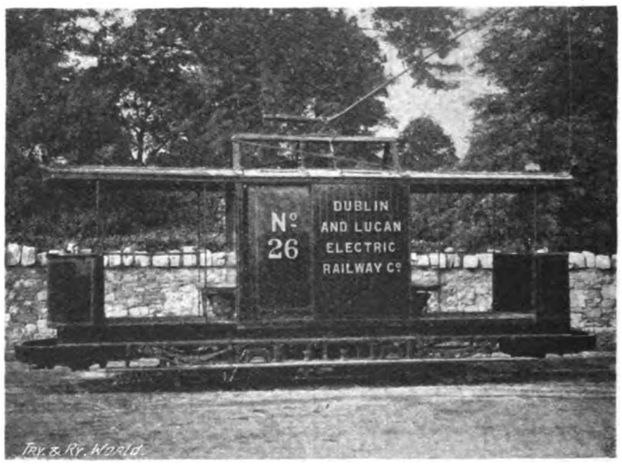
The routes most used by tourists are (1) to the Citadel, (2) to the principal railway station and Abassieh, (3) to Old Cairo, (4) to Boulak, (5) to the Zoological Gardens and the Pyramids, (6) to Heliopolis. For some years the usual way of seeing the Pyramids was to journey by electric car from the Kasr-el-Nil Bridge after an early breakfast, and return to Cairo in time for lunch, but this plan does not give time for more than a climb to the summit of the Pyramid of Cheops, a glance at the Sphinx, and a hasty inspection of the interior of the Great Pyramid. Tourists with more time at their disposal travel by electric cars to the Pyramids, and sleep at the hotel at the foot of the Pyramids. This plan enables them to climb the Great Pyramid in comfort early the next morning, before the rush of tourists from Cairo. The original route to the Pyramids *via* the Kasr-el-Nil was 8·9 miles, but since the construction of the Boulak Bridge it has been considerably shortened, and part of the original route has been abandoned.

The first electric lines were opened for traffic in 1896, and they were afterwards considerably extended, the extension including the route to the Pyramids. The original mileage was 14·26 miles, mostly double track, with a metre gauge. In 1899 there were 36 miles of track, and considerable extensions have since been constructed, together with additions to the generating plant. The power-station is situated near the point where the Ismailia Canal enters the River Nile. The water for the station is taken from the Nile and stored in a reservoir, but before entering the basin it is freed from the large quantities of sand in suspension by means of a filtering arrangement. The car shed and the repairing shops are in the vicinity of the power-station. The tramways were constructed for the Société anonyme des Tramways du Cairo, of Brussels, by a German company, although some of the rolling stock is of British manufacture. Besides passing through the principal streets, the lines go through the fashionable quarter in which European and Turkish dignitaries reside. Germans at that period were prominent. A journey over the various routes affords an opportunity of viewing the life in the streets of an Oriental town as well as the most beautiful parts of what is, to the Westerner, a most interesting city. The lines are in close proximity to the mosques and minarets, palaces surrounded by beautiful parks of Mohammedan and State officials, and to the citadel which majestically rises above the city.

A SMALL ELECTRIC LOCOMOTIVE FOR GOODS TRAFFIC.

The accompanying illustration shows a handy little electric locomotive which is used for goods haulage on the Dublin and Lucan Electric Railway. The vehicle is perhaps unique as to its functions, because besides being a locomotive for hauling wagons, it can carry goods and passengers itself. It will be noted that there are passengers' seats on the platforms, while the closed structure in the centre is a cabin for perishable goods.

The total length of the vehicle over bumpers is 26 ft., the length over platforms is 23 ft., and the width over all is 7 ft. 6 in. The height from the ground



Electric Locomotive—Dublin and Lucan Electric Railway.

to the step is 14½ in. The cabin measures 8 ft. by 5 ft. 6 in., and is fitted with sliding doors suspended on McCabe rollers, while the platforms are 7 ft. 6 in. by 6 ft. The seats provided can accommodate ten persons. A Brill truck with a 7 ft. 6 in. wheel base is surmounted by a heavy section rolled steel frame which carries the superstructure. There are two British Thomson-Houston motors of G.E.58 type, and the controllers are of the same firm's B.18 design. Hand and rheostatic brakes and acetylene and electric lights are provided. The couplers are fitted with Spencer-Moulton rubber springs, and the whole of the drawbar arrangement is hung from the rolled steel frame. The superstructure of the machine was built in the Dublin and Lucan Company's workshops.

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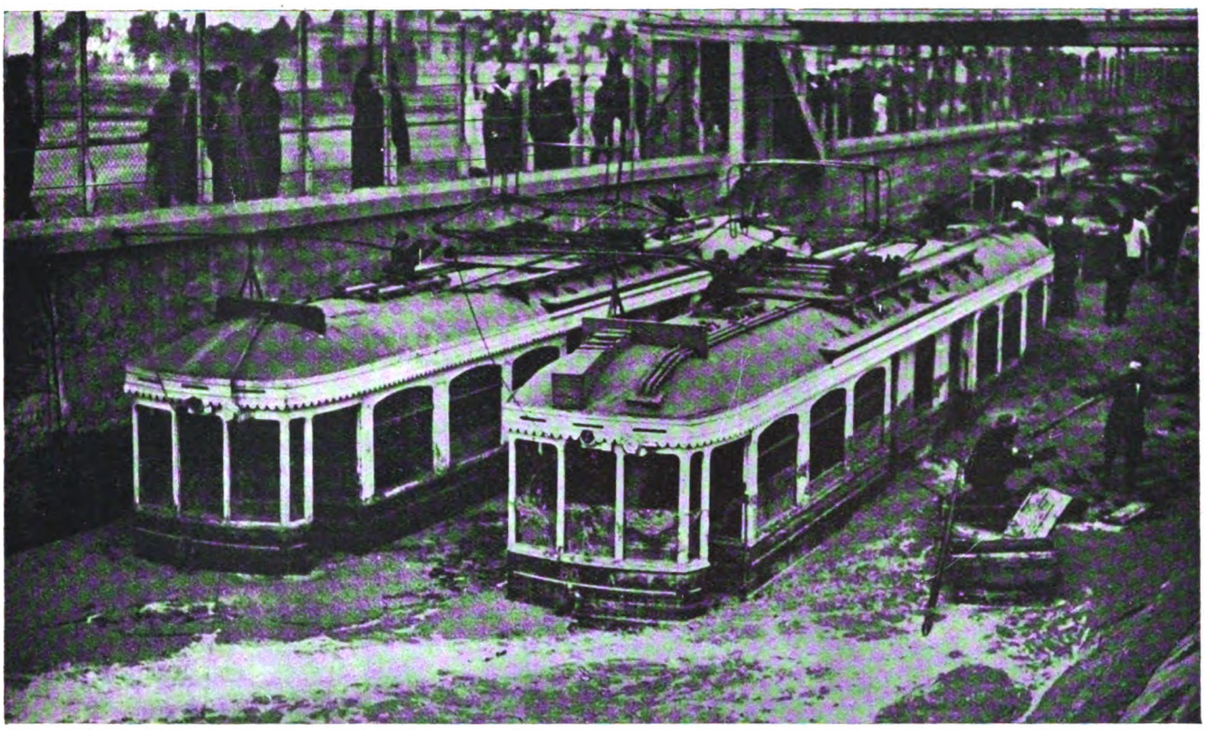

Cairo Electric Cars Buried by Water and Sand.

British Soldiers Extricating the Cars from the Sand after the Flood Subsided.

ELECTRIC CARS OF THE CAIRO RAILWAY AND TRAMWAY SYSTEM CAUGHT BY A NILE DELUGE.

The cars illustrated run from Cairo to Heliopolis and are equipped with both wheel and pentagraph trolleys, the latter being used on the high speed section

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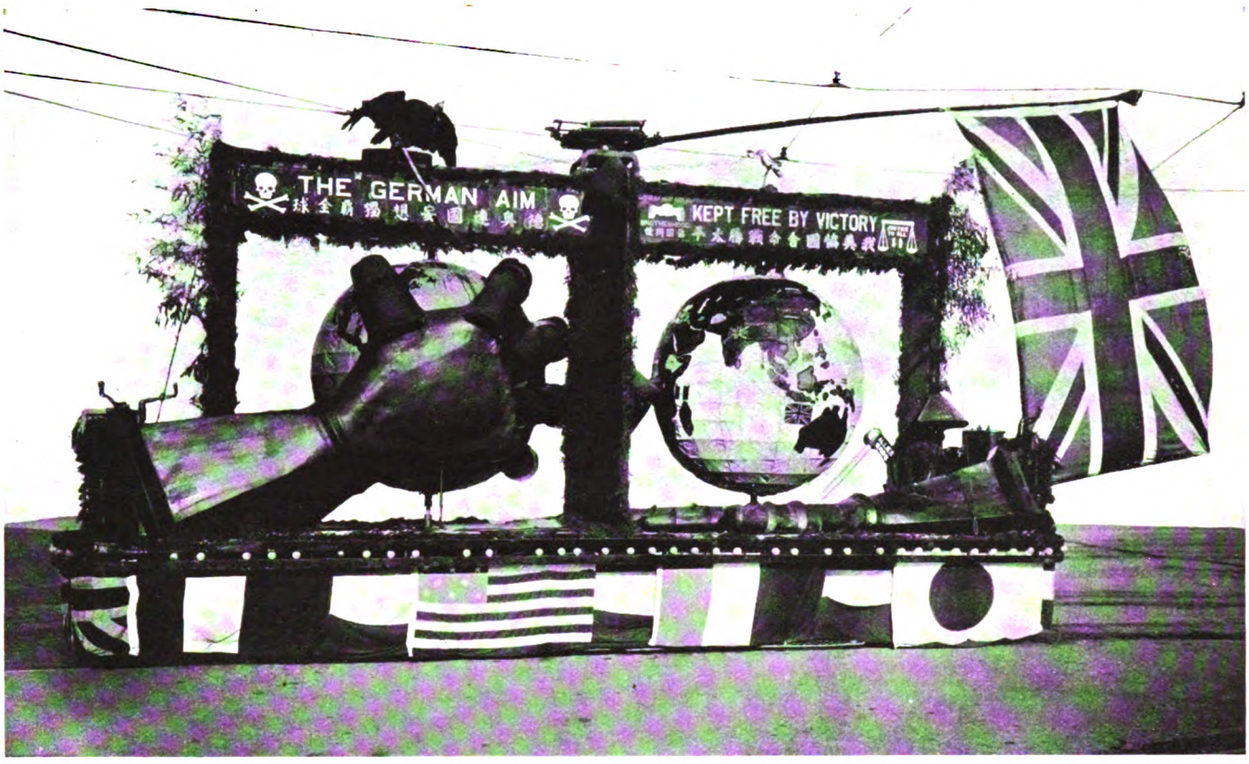
VICTORY CELEBRATION AT SHANGHAI.

PAGEANT ON THE TRAMWAYS.

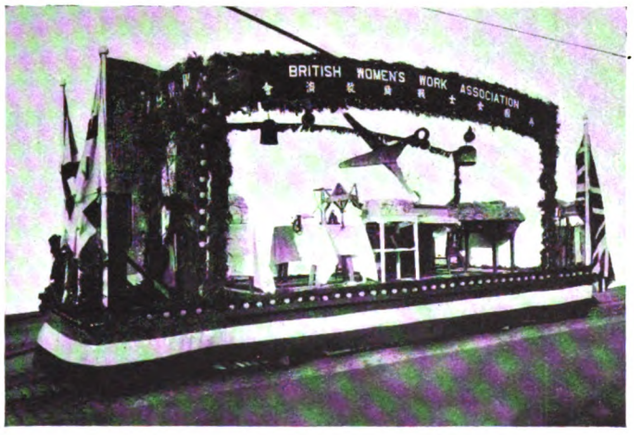
Probably a more fitting symbol of the triumph of civilisation over German barbarism has not emanated from British hands than the Victory Car which was the leading feature of the celebration in Shanghai of the signing of the armistice. For this and two other symbolic cars that took part in the pageant credit is due to Mr. D. McColl, the general manager, and his assistants on the staff of the Shanghai Tramways.



Shanghai Tramway Car Symbolising the Allied Victory.

The two illustrations appearing on this page convey some idea of the merits of the cars, and a perusal of a description of the Victory Car will enable the reader to appreciate its effectiveness, which was greatly enhanced when running illuminated at night.

On the Victory Car were mounted side by side two enormous globes of the world, which were illuminated from the inside. One globe was surmounted by a German eagle perched on a sword, above an illuminated sign reading in English and Chinese, "The German Aim." This inscription was flanked on either side by crossbones and skull.



Another Car in the Armistice Pageant at Shanghai.

The globe was painted with all the lands black and flying the German flag, and the sea was a dull grey. The globe was stationary, in the grip of an enormous mailed fist. It depicted, graphically, the sinister aim of German militarism to subjugate the whole world and hold it in thrall.

The other globe was surmounted by a dove over an illuminated sign reading, in English and Chinese, "Kept Free by Victory," with the scales of Justice to its left and the clasped hands of "Brotherhood" to its right. This globe (which revolved to typify Freedom and Progress) was painted in bright colours to show all the different countries, each flying its own flag, the sea being a cheerful blue.

Underneath the globe lay the mailed fist, shrunken and battered, and transfixed by a sword designated "Allies." The car also carried the flags of the Allies, which were shown up by strings of electric lamps. Two other cars were representative of agencies which have contributed to the Allies' triumph. One gave an excellent idea of the familiar Tank, which was given a white hue, the reverse of the grimy appearance of the travelling forts that did so much to smash the German defence

A graceful compliment was paid to the British women of the Settlement by the third car. This depicts the British Women's Work Association in Shanghai, an organisation that contributed a large number of articles that gave comfort to the wounded in the hospitals and aided their recovery.

The Shanghai Electric Construction Company, Limited, are to be congratulated upon having in their tramway officials Brit shers who so well responded to the needs of an historic occasion.

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POSITION OF ITALIAN RAILWAYS AND TRAMWAYS.

The *Socie'à per Azioni* has published an interview with Prof. Tiaini, president of the Federation of Transports, on the position of the Italian Railways and Tramways. The Professor observed that most of the railways in Italy being run by the State, it is forgotten that many railways and tramways are worked by private industry—4,000 kilometres of railway and 5,000 kilometres of town and interurban tramways. These railways and tramways are of great importance; they represent a capital of about three milliards of lire with a gross yield of about a quarter of that of the great State railway system. Dealing with the difficulties caused by the war, and the inadequacy of the increases in the tariffs, which were considerable, and of other concessions, the Professor said that the State ought to take a deeper interest in the affairs of the companies. The concessions already granted are not quite clear, and require a good deal of time allowance.

Owing to the enormous increase in the price of metal materials, both railways and tramways have been obliged to slacken in the maintenance of the rails and rolling stock. The equipment generally has seriously depreciated, and the locomotives and cars run with difficulty.

Preparations should be made at once for the work of reconstitution. The manufactories of projectiles the day when peace is declared will have no more war work, and they will have to turn promptly to the construction of locomotives and cars. The gun foundries will have to start immediately rolling rails. If this is not done the evil will be doubled.

Prof. Tiaini counsels the institution of standardisation of materials in order to effect construction in series at a rapid rate and at prices easy to quote. If after the war, he continued, they wished to provide for themselves they must prepare immediately; for nothing can be improvised. They must build up factories for electrical materials useful for traction work. This requires a certain understanding between users and constructors, because it is not a question of preparing new lines only, but rather by the repair of existing material and the adaptation and provision of equipment, that should be prepared in time. The types of material would have to be submitted for approbation to the Government.

In the years preceding the outbreak of war there was in Italy a considerable development in the construction of railways entrusted to private enterprise; this occurred thanks to legislation granting increased subsidies by the State in order to stimulate such work. It is estimated that roughly there were 6,000 kilometres of railway and as much tramway under construction when the war started. Naturally the war necessitated the suspension of this work, and made the conditions attending the concessions very onerous, so much so that some of them had to ask for a moratorium. As a measure for giving employment to the great quantity of labour that will be liberated by peace, one should begin now to initiate a recommencement of this work.

Sorbitic Treatment of Rails at Bournemouth.—Mr. I. Bulfin, general manager of Bournemouth Corporation Tramways, has been authorised by the Tramways Committee to arrange for the application of the sorbitic treatment of the rails on a mile of single track. Messrs. Scholey and Company, of 56, Victoria Street, Westminster, S.W., have undertaken to carry out the work at a cost of £1 per yard of single track. It is estimated that the treatment, which was described in THE TRAMWAY AND RAILWAY WORLD of April 11, 1918, will add 50 per cent. to the life of the rails.

TRAMWAYS (BOARD OF TRADE) COMMITTEE.

DISSOLUTION OF A WAR TIME ORGANISATION.

The Tramways (Board of Trade) Committee has now been dissolved. During the past month the committee were engaged in winding up their affairs, and the offices in Buckingham Gate were closed on February 28. Although at the outset the committee began their labours amid a great deal of misapprehension, they accomplished some useful work for the industry during the latter part of the war, and it is a matter of regret that such a body was not brought into existence two years earlier. If that had been done it is probable that tramway undertakings would have experienced less difficulty in securing materials to maintain their tracks and cars in running order.

Soon after the formation of the Ministry of Munitions for the purpose of organising the national resources for the production of war material the troubles of tramway proprietors began to assume an acute form. Nor did matters improve when the Ministry set up a Priority Committee for the purpose of allocating such materials as could be spared. Lack of co-ordination was responsible for the failure of the Priority Committee, and at last the President of the Board of Trade decided to appoint the Tramways Committee.

At the outset there was some criticism of the Committee owing to municipal tramway authorities claiming that they should be given more representatives upon it. The Committee was originally constituted as follows:—Mr. James Devonshire (chairman), Mr. A. R. Fearnley, Mr. A. L. C. Fell, Mr. J. B. Hamilton, Mr. R. J. Howley, and Mr. J. M. McElroy, with Mr. J. N. Wilson (Glasgow) as secretary. After some months' service the latter gentleman resigned, and was succeeded by Mr. S. F. James, hon. solicitor to the Municipal Tramways Association. As a result of the objections of the municipal authorities to the constitution of the Committee, Mr. J. Dalrymple, general manager of Glasgow Corporation Tramways, was added to the members before the Committee had actually begun work. The country was divided into nine areas, members of the Committee addressed meetings in each division, and officials were appointed from the constituent undertakings for carrying on the work in collaboration with the Board of Trade Committee.

With the development of the work dissentient voices for the most part ceased to be raised, and in justice to the Priority Committee of the Ministry of Munitions it must be admitted that the operations of the Tramways (Board of Trade) Committee were facilitated by one of the later actions of the former body, namely, the collection of information as to what sections of tramways were of importance in the transport of munition workers. The Tramways Committee's work, amongst other things, was to make arrangements for supplying cars to munitions centres from places where munition work was not carried on, and from towns in which cars were laid by for want of crews. The Committee's operations also comprised authority to require rails to be taken up on sections not of national importance in order to repair and relay tracks upon which cars were run for the conveyance of labour engaged on work of national importance, but very little was done under these powers. Later on, when the position on the Western Front necessitated the transfer of more miners into the army, the Tramways Committee and their area committees assisted in bringing about the restriction of services and other methods for securing a reduction in the consumption of coal in the generating stations,

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THE

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A New Era in Transport.

Where now is *laissez faire?* What has become of individual energy and effort, and the bracing effect of free competition? Where are the doctrines "On Liberty" of John Stuart Mill? What has become of the fundamental principle laid down by Herbert Spencer that the sole legitimate function of the State is to maintain and administer justice? All are gone—blown to pieces by the high explosive of a world-shaking war. For years they had been crumbling, and had reached such a friable condition that their final disintegration was comparatively easy. We are now entering on a new era in which, for good or evil, the control of the State is to be spread over a multitude of human activities. Only in one way can the change be justified, namely, that it should bring with it such a co-ordination and such an increase in human efficiency and comfort that men will not seek to go back to their old liberty. Whether the justification will come or not time alone can show. But the experiment must be made. The immediate example of the activities of a Government which wishes to organise, systematise, co-ordinate, and control almost everything for the benefit of the public, and particularly of the working man, is to be found in the Ministry of Ways and Communications Bill, to which several pages of this issue are devoted. It foreshadows stupendous changes in the transport system of the country. So far-reaching and revolutionary are the proposals that the storms of opposition and criticism have already gathered volume and force. The policy involved will almost inevitably lead to the nationalisation of the railways, and probably of canals, harbours, and electricity supply of the country. That clean sweep may be distant, but it is evidently the goal. On the other hand, the Bill is so drafted that changes in the direction indicated may be made gradually and tentatively, and if undesirable results ensue the policy may be suspended. All sorts of alternatives are feasible, not only because the new Minister has such wide powers, but because important specific steps in the direction of national ownership and management can be authorised by Orders in Council from time to time. Parliamentary control is in this way reduced to a minimum. So far as the railways are concerned, the removal of the Government guarantee of receipts would in many cases mean bankruptcy. The State has during the war put the railways in such a position that the shareholders are entitled to demand protection and fair treatment. That points to nationalisation, with an enormous but remunerative addition to the national debt and with the elimination of wasteful competition. The argument does not apply in the same way to tramways, as these cannot form one co-ordinated system like the railways, and municipal tramways are specifically excluded from compulsory purchase. Their financial difficulty, however, is in some cases even worse than that of the railways. There has been no general 50 per cent. increase of fares, as on the railways, and increases above the statutory maxima can at present only be brought about with difficulty and delay. In one way or another the tramways must have financial relief if they are to be carried on as self-sustaining enterprises. On the general aspect of the scheme it need only further be said that probably no better man than Sir Eric Geddes could be found for initiating and working out the gigantic task which awaits the Minister of Ways and Communications. What it is possible for one man to do he will do; and he will, of course, departmentalise the work, and relegate important duties to assistants. Among them will be enthusiasts in the develop-

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ment of the roads; and they will see to it that the fullest use is made of these and of motor traction compatible with the supreme objects of securing the greatest efficiency and economy in our national system of communications. The Government have, in fact, adopted the policy set out in the first issue of this journal. They propose "to hold the balance evenly between conflicting interests, and steadily to advocate and enforce development, improvement, and advance in every section of transport undertakings." It is an ideal not easily attained, but in proportion as they approach it so we are convinced will the prosperity of the country be consolidated and extended.

London's Linking-up Proposals.

The Metropolis has, from the beginning of tramway enterprise, always had to contend with retrograde influences to which provincial Corporations are happily strangers. For instance, more than a decade had to be spent in fighting strong opposition in both Houses of Parliament before the tramways could be brought over the bridges and connected by a track along the Victoria Embankment. The wonder is that the population of London have tamely submitted to a medieval dominance that no self-respecting provincial town would endure. For that reason it is fortunate—not unfortunate, as one member of the Council suggested—that the present scheme for securing Parliamentary sanction to the linking up of the disjointed tramway system was brought up on the eve of the triennial election. It has the support of all parties, and was carried with only two dissentients. The Bill will therefore go before Parliament as the demand of the ratepayers that their property shall be developed in a commonsense manner, and the public be given facilities for through travel without having, for instance, to walk over the intervening distance of three-quarters of a mile between Blackfriars Bridge and Farringdon Road. The City representative who was rash enough to express opposition repeated the parrot cry that the Farringdon Road and Blackfriars Bridge line would lead to congestion. It is regrettable that the Chairman of the Highways Committee was led by this assertion to suggest that the link should be a single line. That would certainly conduce to congestion. Farringdon Road and Farringdon Street, which are the chief thoroughfares to be traversed by the link, are two of the widest in London, and New Bridge Street is of more than average width. The congestion resulting from a single track would be accentuated at Ludgate Circus, where it is necessary that as many up and down cars as possible should be passed over at one time rather than that cars should be held up at the present terminus at Farringdon Road and on the short length of double line which would branch off from Blackfriars. Even then there would have to be electrical signalling to indicate when up and down cars are free to proceed over the long stretch of single line connection. If the City representatives wish to witness obstruction they should pay a visit any evening to the Blackfriars queues, and note the patient workers from the city standing for an hour and more waiting for a car. This delay, which involves physical injury to children, women, and men, would be averted by the linking up with Farringdon Street, thus enabling thousands of residents south of the Thames to board cars without going down to the Embankment. Equally necessary are all the other north of Thames proposals; and we cannot believe the public will longer allow reactionary interests to delay such imperatively needed improvements in the London tramway system.

A Whitley Council for the Tramway Industry.

The formation of a National Joint Council for the tramway industry is now practically assured. Both municipal and company-owned tramways will come into the organisation, and this circumstance has entailed considerable negotiation, as both the municipal and the company interests have been anxious to preserve a just balance in their respective representations. All outstanding matters have, however, been adjusted, and the draft constitution has been agreed to by the representatives of the tramway undertakings and the employees' union. As soon as the formal approval of the local authorities and the companies has been given to the constitution, which is not likely greatly to delay matters, the scheme will be put into operation. The Council can hardly fail to be of great service to the industry in maintaining harmonious relations between employers and employees and in promoting general efficiency. The text of the constitution is given on the following page.

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NATIONAL JOINT COUNCIL OF THE TRAMWAY INDUSTRY.

TEXT OF THE CONSTITUTION AS APPROVED BY THE CONSTITUENT ASSOCIATIONS.

The constitution of the National Joint Industrial Council for the Tramway Industry has now been approved by the constituent associations. These include the Municipal Tramways Association, the Tramways and Light Railways Association, and the National Transport Workers' Federation. The Joint Council will consist of 44 members, 22 being representatives of the employers and 22 of the employees. Of the employers' representatives 14 will be elected from the members of municipal tramway committees and (or) officers of the tramway departments, and eight from the directors and (or) officers of tramway and light railway companies. The members of the Council will retire annually, and will be eligible for re-election. The National Transport Workers' Federation have undertaken to secure that all the employees of the traffic staffs and the semi-skilled and unskilled men engaged in other branches of the industry shall be represented on the employees' side of the Council.

The text of the constitution is appended:—

OBJECTS.

To secure the largest possible measure of joint action between employers and workpeople by the consideration of matters affecting the well-being and progress of the industry, as part of the national life.

It will be open to the Council to take any action that falls within the scope of this general definition. Among its more specific objects will be the following:—

(*a*) The establishment and definition of the functions of District Councils and Works Committees.

(*b*) The consideration of measures for the inclusion of all employers and workpeople in their respective Associations, and for securing the observance by them of collective agreements.

(*c*) The consideration of wages, hours, and working conditions which affect the industry as a whole.

(*d*) The consideration of the existing machinery for the settlement of differences between the parties and sections in the industry, and the establishment of machinery for this purpose where it does not already exist.

(*e*) The consideration of measures for securing regular employment as far as possible, while providing the public with the most efficient service.

(*f*) The improvement of conditions with a view to removing danger to the health of the workpeople and minimising accidents.

(*g*) The consideration of safeguarding the rights of workpeople inventing or designing improvements in machinery and method.

(*h*) The supervision of entry to and training for the industry, and co-operation with the educational authorities in arranging education in all its branches for the industry.

(*i*) The inquiry into special problems of the industry, including the study of the organisation and methods of the industry in this and other countries, and, when desirable, the publication of reports.

(*j*) The collection of statistics and information on matters appertaining to the industry

(*k*) The representation of the needs and opinions of the industry to the Government, Government Departments, and other authorities.

(*l*) The consideration of matters that may be referred to it by the Government or any Government Department.

(*m*) The consideration of problems of re-construction and labour re-settlement after the war, in so far as they affect the industry.

(*n*) The co-operation with other Joint Industrial Councils and other bodies dealing with problems of common interest.

MEMBERSHIP.

The Council shall consist of forty-four members representative of the industry, being twenty-two representatives of the employers and twenty-two representatives of the employees.

EMPLOYERS' REPRESENTATIVES.

The representatives of Municipal Tramways shall be fourteen in number and be elected from—

(*a*) Members of Tramway Committees and/or

(*b*) Officers of Tramway Departments.

The representatives of the Tramway and Light Railway Companies shall be eight in number and be elected from—

(*a*) Directors of Tramway or Light Railway Companies and/or

(*b*) Officers of Tramway or Light Railway Companies.

EMPLOYEES' REPRESENTATIVES.

The representatives of the employees shall be twenty-two in number and shall be elected as follows:—

(The details of this procedure will be arranged after further conferences with the employees' representatives.)

RE-ELECTION.

The members of the Council shall retire annually and shall be eligible for re-election.

COMMITTEES.

The Council shall have power to appoint from its own members Executive and other Committees, and to define the powers of such Committees. Unless otherwise agreed, such Committees shall be equally representative of both sides of the Council.

OFFICERS.

The Officers shall consist of a Chairman, a Vice-chairman, a Treasurer, and a Secretary or Secretaries. The Chairman and Vice-chairman shall be elected from the members of the Council. When the Chairman is a representative of the employers, the Vice-chairman shall be a representative of the employees, and *vice versa*.

The Council shall be empowered to appoint a Treasurer, a Secretary or Secretaries, and the necessary staff, and shall be empowered to pay to them such remuneration as it may think fit.

MEETINGS OF THE COUNCIL.

The ordinary meetings of the Council shall be held as often as necessary, and not less frequently than once a quarter. A special meeting shall be called on the requisition of one-third of the Council. At least seven days' notice of such special meeting shall be given, and the business of the meeting stated in the notice.

VOTING.

The voting shall be by show of hands or otherwise as the Council may determine.

Subject to the exceptions set forth in the following paragraph, all resolutions shall be regarded as carried if they have been approved by a majority of the members present on each side of the Council

(Here will follow a clause to be agreed between the representatives of the Municipal Tramways Association and the Tramways and Light Railways Association.)

QUORUM.

Not less than one-half of the representatives of each side shall constitute a quorum of the Council.

FINANCE.

The expenses of the Council shall be met by the two sides of the Council in equal proportion.

DISTRICT COUNCILS.

It is provisionally suggested that District Councils shall be established for the following areas, viz.:—

Scotland.
Northumberland and district.
Lancashire, Cheshire, and North Wales.
Yorkshire and Lincolnshire.
South Wales.
Midlands.
Metropolitan District.
South-west and part of South Coast.
East, South-east, and part of the South Coast.

PASSING THE STATIONARY TRAMCAR.

BY-LAW ADOPTED BY THE JOHANNESBURG COUNCIL.

The Johannesburg Municipal Council adopted the following resolution:—

"That in the opinion of the Council the Traffic By-laws should be amended so that it will be an offence against the by-laws for any person to drive a vehicle or ride a horse or other animal or bicycle on the left or near side of any tramcar for the time being for the purpose of taking up or setting down passengers until the roadway is clear of persons entering or leaving such tramcar; provided that any such person may drive or ride such vehicle, horse, or other animal or bicycle past the right or off side of such tramcar if the roadway is sufficiently clear for that purpose."

The licence officer has since reported on the matter, and is of opinion that a by-law in the above form would have a dangerous tendency, inasmuch as it might be interpreted by drivers as giving them a right of way on the right-hand side of the car, and with a number of drivers this would mean a lessening of the exercise of care. It is inadvisable, he thinks, even by implication to lay down the side on which a motor or other vehicle should pass a tram. It should be left to the driver's discretion, and the full responsibility should be his.

To meet the case, the General Purposes Committee considers that the Traffic By-laws should be amended by the addition of the following words:—

"The driver of any vehicle or the rider of any animal, motor cycle, or bicycle shall, when overtaking a tramcar which is not in motion, stop his vehicle, animal, or cycle at a distance of at least 10 feet from such tramcar, and shall not proceed to pass such tramcar until he can do so with safety to the life and limb of every person who has alighted from, or may be about to alight from or to board, such tramcar."

The committee considers that such a regulation would not entail great hardship on drivers of motors or other vehicles. If properly enforced, the stop prior to passing would prevent the rushing past trams without slackening speed which is so often seen, and ensure careful driving past the stationary tramway car.

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MINISTRY OF WAYS AND COMMUNICATIONS.

INTRODUCTION IN THE HOUSE OF COMMONS OF THE BILL FOR ITS ESTABLISHMENT.

FULL TEXT OF THE MEASURE.

In the House of Commons, on February 26, the Home Secretary (Mr. Shortt) under the ten minute rule introduced a Bill to establish a Ministry of Ways and Communications and for purposes connected therewith. Associated with the Home Secretary were Sir Albert Stanley (President of the Board of Trade), Major Baird, and the Attorney-General. Sir Eric Geddes will be the first Minister of the proposed department and the salary of the Minister will be £5,000, and of the two Parliamentary Secretaries, £1,500 each.

The HOME SECRETARY said he did not think it was any exaggeration to say that probably no question was of more importance to the country than that of transport and communications. They could develop no industry in this country unless they had adequate facilities for transport, and unless they had cheap transit. They could do nothing with the housing question or with the development of agriculture unless they could provide adequate transport. In the past they had had many means of transport, but they had had no co-ordination. Roads were no doubt at one time a purely local question, but that was not so now, owing to the introduction of motor and mechanical transport. In August last a Committee was set up to inquire and report as to what steps were desirable to develop internal facilities for transport in the United Kingdom and to acquire effective supervision for co-ordination in order to ensure that such development would be adequate and suitable to meet the requirements of the country. That Committee had arrived at the conclusion that they could not allow the organisation of the transport systems of the country to revert to pre-war conditions. When the control of railways was taken over in 1914 an arrangement was made by which the net receipts of the companies were guaranteed for two years after the termination of the war. The result of that was that the Government proposed to set up a Ministry to maintain for the two years the whole of the control which they had during the course of the war, and at the same time to give them power during those two years to consider the whole question and to make such changes as and when they thought it desirable.

Sir E. CARSON (Duncairn).—Does that mean they will have power to nationalise the railways ?

Mr. SHORTT.—Not without the consent of this House. It was proposed that the Ministry should take control of the railways, light railways, tramways, canals, waterways, and inland navigation. Up to the present the roads had been under diversified control, and it was proposed that roads, bridges, vehicles, and traffic should be included in the Bill. Already a large number of powers were exercised over roads, railways, canals, and tramways by Government departments, but there was no one department which could co-ordinate the whole of the control It was felt that this necessary control and co-ordination was better in the hands of one Minister. It was further proposed to give to the Ministry the control of the supply of electricity. It was suggested that the interests of the railways and tramways so far as electricity was concerned were uot those of the consumer of power. The exact opposite was the case. The railways would profit the more industries prospered. Therefore there was every inducement to the railways to see that every individual in the country, every manufacturer, everyone who could improve his business by the use of power, was able to get that power as cheaply as possible. The Bill would require considerable discussion, he had no doubt, and in a matter of that kind they must have a fully ample sketch of its terms.

Sir EDWARD CARSON.—Does it apply to the whole of the United Kingdom ?

Mr. SHORTT.—Yes, and nowhere more than in Ireland.

Mr. RENWICK (Newcastle-on-Tyne).—Will it apply to waterways such as the Manchester Ship Canal ?

Mr. SHORTT.—Yes.

Mr. JOYNSON-HICKS (Twickenham) said that the Bill was going to create the most powerful Ministry ever set up in this country. The Minister at the head of it would have to be a superman. (Laughter.) The House might not know that 208 members had joined the committee he (the hon. member) had formed. He contended that roads and railways should be kept separate. There were 152,000 miles of roads in this country and 2,000 road authorities. He pointed out how the motor interests had grown, and there were now people who lived in roads—were "born in roads"—(general laughter)—at any rate, there were people who ought to have the job of developing the roads. He suggested the revivifying of the Road Board and the co-ordination of the work of two Ministers—one of roads, one of railways—by the Cabinet.

The Bill was read a first time. Its text is as follows :—

A BILL TO ESTABLISH A MINISTRY OF WAYS AND COMMUNICATIONS AND FOR PURPOSES CONNECTED THEREWITH.

Be it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :—

APPOINTMENT OF MINISTER OF WAYS & COMMUNICATIONS.

1.—For the purpose of improving the means of, and the facilities for, locomotion and transport, it shall be lawful for His Majesty to appoint a Minister of Ways and Communications (hereinafter referred to as the Minister), who shall hold office during His Majesty's pleasure.

POWERS AND DUTIES.

2.—(1) It shall be the duty of the Minister to take steps to carry out the purposes aforesaid, and there shall, as from such date or dates, as His Majesty in Council may by Order determine, be transferred to the Minister all powers and duties of any Government Department in relation to -

(*a*) railways ;
(*b*) light railways ;
(*c*) tramways ;
(*d*) canals, waterways, and inland navigations ;
(*e*) roads, bridges, and ferries, and vehicles and traffic thereon ;
(*f*) harbours, docks, and piers ;
(*g*) the supply of electricity ;

including any powers and duties of any Government Department in relation to any railway, light railway, tramway, canal, inland navigation, harbour, dock, pier, electricity, or other undertaking concerned with any of the matters aforesaid, and any powers of any Government Department with respect to the appointment of members or the procedure of the Railway and Canal Commission or of any commissioners, conservancy board, or other body having jurisdiction with respect to any such matters as aforesaid :

Provided that—

(i) His Majesty in Council may by Order except from such transfer any particular powers or duties, or provide for the exercise or performance of any power or duty so excepted by the Minister concurrently or in consultation with or at the instance of the Government Department concerned, or by the Government Department concerned concurrently or in consultation with the Minister, or provide for the retransfer to any such Department of any powers and duties transferred to the Minister by this section ; and

(ii) Nothing in this section shall transfer to the Minister any powers or duties of the Admiralty exercisable in or in relation to ports declared under the Dockyard Ports Regulation Act, 1865, to be dockyard ports, but His Majesty in Council may by Order transfer to the Admiralty, instead of to the Minister, any of the powers of the Board of Trade with respect to dockyard ports, or with respect to the appointment of members of any commissioners, conservancy board, or other body having jurisdiction in the whole or any part of a dockyard port.

(2) His Majesty in Council may by Order make such incidental, consequential, and supplemental provisions as may be necessary or expedient for the purpose of giving full effect to any transfer of powers or duties by or under this section, including provisions for the transfer of any property, rights, and liabilities held, enjoyed, or incurred by any Government Department in connection with any powers or duties transferred, and may make such adaptations in the enactments relating to such powers or duties as may be necessary to make exercisable by the Minister and his officers or by the Admiralty and their officers, as the case may be, the powers and duties so transferred.

(3) In connection with the transfer of powers and duties to the Minister or the Admiralty by or under this Act, the provisions set out in the Schedule to this Act shall have effect.

POWER TO CONTROL TEMPORARILY RAILWAYS, ETC.

3.—(1) With a view to affording time for the consideration and formulation of the policy to be pursued as to the future position of undertakings to which this section applies, the following provisions shall have effect for a period of two years after passing of this Act:

(*a*) Where at the passing of this Act possession has been taken of any railroad undertaking or part thereof in

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pursuance of section sixteen of the Regulation of the Forces Act, 1871, or otherwise, possession thereof may be retained without any renewal of the warrant granted by the Secretary of State in pursuance of that section upon the same terms as to payment as those heretofore in force, and the Minister may exercise over all such undertakings all such powers as have hitherto been exercised by the Board of Trade under the said Act or with the consent of the owners of the undertakings or otherwise, and such other powers as may be conferred by this section or agreed to by the railway companies concerned :

(*b*) The Minister may take possession in the name or on behalf of His Majesty of the whole or any part of any other railway undertaking or of any light railway, tramway, canal, inland navigation, harbour, dock or pier undertaking, or of any plant belonging thereto or used thereon, and of the railway wagons of any private owner required for use on any railway of which possession has been taken, and of any barges, tugs, and other craft required for use on any canal of which possession has been taken :

(*c*) The directors, officers, and servants, of any undertaking of which, or of the plant whereof, possession is retained or taken shall obey the directions of the Minister as to the user thereof and any directions of the Minister—

(i) as to the rates, fares, tolls, dues, and charges to be charged ;

(ii) as to the salaries, wages, and remuneration and conditions of employment of persons employed on or in connection with any undertaking of which possession has been taken ;

(iii) as to the working or discontinuance of the working of the undertaking or any part thereof including directions as to keeping open or closing of any stations ;

(iv) for securing that the permanent way, rolling stock, plant, appliances, or equipment, whether fixed or moving, are satisfactory in type and design ;

(v) as to the carrying out of alterations, improvements, and additions which the Minister considers necessary for the public safety or for the more efficient and economic working of the undertaking ;

(vi) for securing co-operation between undertakings and for securing the common user of facilities, rolling stock and equipment whether fixed or moveable ;

(vii) for affording running powers over their system, or any part thereof, to the owners of any other undertaking ;

(viii) for securing that manufacturing and repairing facilities, and auxiliary and ancillary services shall be used, and the purchase and distribution of stores shall be conducted, in such manner as may be most conducive to economy and efficiency ;

(ix) as to the preparation and submission to the Minister at such times and in such form and manner as the Minister may require of statistics and other returns, and of accounts at such times and in such form and manner as the Minister, with the consent of the Treasury, may, by regulations, prescribe ;

(*d*) For enabling any directions given by the Minister as to alterations, and improvements and additions to be carried into effect the Minister may, by order, authorise the owners of any undertaking to acquire any land and to construct any works, and the order may incorporate the Lands Clauses Acts, subject to such modifications as may be specified in the order, being modifications of those Acts made or authorised to be made by the Development and Road Improvement Funds Act, 1909, or any other enactment, and may incorporate or apply any of the provisions of any enactment relating to the construction, maintenance, or working of railways, light railways, tramways, canals, harbours, docks, and piers ;

(*e*) Any rates, fares, tolls, dues, and other charges directed by the Minister shall be deemed to be reasonable, and may be charged, notwithstanding any statutory provisions limiting the amount of such charges or increases therein.

(2) There shall be transferred to the Minister any officer or servant of an undertaking of which possession is retained or taken under this Act whose services the Minister may require, either permanently, with the consent of the officer of servant, or temporarily, with the consent of the undertakers.

In either case until the expiration of two years from the passing of this Act or the acquisition of the undertaking by the Minister, whichever may be the earlier, such officer or servant shall remain a full member of any pension or superannuation fund established in connection with the undertaking with all the rights to which he would be entitled had he continued in the service of the undertakers, and *any contributions payable under the rules of the pension or superannuation fund by the undertakers may be paid by the Treasury out of moneys provided by Parliament*, but no officer or servant whose services are so transferred shall be in any worse position as regards salary or superannuation than he would have been had his services not been transferred, and he shall be entitled to receive such reasonable allowance for temporary disturbance as the Minister may determine, with the consent of the Treasury.

This sub-section shall apply to members of the staff of the Railway Clearing House in like manner as to officers and servants of undertakings of which possession has been taken, and, as respects officers and servants who are members of the railway clearing system superannuation fund, to that fund as if it was a pension or superannuation fund established in connection with an undertaking of which possession has been taken.

(3) Section twenty of the Local Government (Emergency Provisions) Act, 1916 (which relates to the establishment of new routes for omnibuses), shall continue in force until the expiration of two years after the passing of this Act.

(4) Where by reason of the exercise of the powers under this section the value of any undertaking has been depreciated or enhanced, the owners of the undertaking shall, so far as any loss is not provided for by the payments mentioned in paragraph (*a*), be entitled to be recouped or liable to pay the amount by which that value has been so depreciated or enhanced, and if any question arises as to that amount or otherwise with respect to the financial relations between the Minister and any person affected by the exercise by the Minister of any of his powers under this section, the question shall be determined by the Railway and Canal Commission ; and without prejudice to any other form of payment or satisfaction, the Treasury on the recommendation of the Minister may, as or as part of the consideration for exercising any powers of control under this section, guarantee the payment of any dividends on any stock or other securities issued by the owners of an undertaking up to such amount as may be agreed, or the payment of any working expenses of the undertaking, *and any sums required to fulfil any such guarantee shall be paid out of moneys provided by Parliament.*

(5) The provisions of the Railway and Canal Traffic Act, 1888, as amended by any subsequent enactment, relating to the procedure for the determination of questions by the Commission under that Act, including the provisions relating to appeals, shall apply to the determination of questions referred to the Commission under this section, as if they were herein re-enacted and in terms made applicable to this Act :

Provided that—

(*a*) the Commission may, in any case in which they think it expedient to do so, call in the aid of one or more assessors, specially qualified, and hear the case wholly or partially with the assistance of such assessors ;

(*b*) the Commission may hold aslocal inquiry for the purposes of this section by any one of their members, or by any officer of the Commission or other person whom they may direct to hold the same, and the said provisions of the Railway and Canal Traffic Act, 1888, except the provisions relating to appeals, shall, so far as applicable, apply to such inquiries, and any officer or person directed to hold an inquiry shall have power to administer oaths and shall report the result of the inquiry to the Commission ;

(*c*) the Commission may act by two of their members, one of whom shall be the judge ;

(*d*) the discretion of the Commission with respect to costs shall not be limited in the manner provided by section two of the Railway and Canal Traffic Act, 1894.

POWER TO ACQUIRE RAILWAY & OTHER UNDERTAKINGS.

4.—(1) His Majesty in Council may at any time after the passing of this Act by order authorise the Minister—

(*a*) to purchase by agreement or compulsorily and work the whole or any part of any railway, light railway, tramway, canal, waterway or inland navigation, harbour or dock undertaking the acquisition of which is, in the opinion of the Minister, expedient for improving facilities for locomotion and transport :

Provided that the order shall not authorise the purchase otherwise than by agreement of any tramway undertaking belonging to a local authority, or the purchase, without the consent of the local authority, of any tramway undertaking which a local authority are, under section forty-three of the Tramways Act of 1870, entitled to purchase, but where the local authority give such consent the Order may provide for the transfer to the Minister of the rights of the local authority under that section to purchase the tramway undertaking ;

(*b*) to enter into and carry into effect agreements with the owners of any such undertaking for the placing of the undertaking or any part thereof under the control of the Minister to such extent and subject to such financial arrangements as with the consent of the Treasury may be agreed ;

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(c) himself to establish any such undertaking and to work and maintain the same, and for that purpose to acquire any lands either by agreement or compulsorily, and the order may incorporate the provisions of the Lands Clauses Acts, subject to such modifications as may be specified in the order, being modifications of those Acts made or authorised to be made by the Development and Road Improvements Funds Acts, 1909, or any other enactment, and the Order may incorporate or apply any of the provisions of any enactment relating to the construction, maintenance, or working of railways, light railways, tramways, canals, harbours, docks, and piers;

(d) to lease the whole or any part of any undertaking so acquired or established;

(e) to purchase or take on hire and lease railway wagons belonging to any private owners;

(f) to establish, maintain, and work transport services by land or water;

and it shall be lawful for the owners of any undertaking to which any such Order applies to enter into and carry into effect any agreement authorised by or required for the purposes of the Order.

(2) An Order in Council under this section authorising the purchase of any undertaking or part thereof may provide for vesting the undertaking or part in the Minister either subject to any mortgages, debentures, debenture stock, or other charges and obligations affecting the undertaking or discharged therefrom or from any of them, and for preserving the rights and security of the persons entitled to such charges, or for giving them a substituted charge on the consideration paid for the undertaking, and may provide for the transfer to the Minister of officers and servants of the undertaking, and shall secure that no officer or servant so transferred shall be in a worse position as respects tenure of office, remuneration, or superannuation allowances than if no such Order had been made, and any Order made under this section may contain such incidental, consequential, and supplemental provisions as may appear to be necessary or proper for the purposes of the Order.

(3) The consideration for the undertaking or property so acquired shall, in default of agreement, be determined by a court of arbitration constituted in accordance with the provisions of the Order authorising the acquisition.

(4) Any capital sum payable under an agreement or award may be discharged in whole or in part, if the Treasury so direct, by the issue of securities, and the amount of such securities equivalent to such capital sum shall, in default of agreement, be determined by a court of arbitration constituted as aforesaid.

For that purpose the Treasury may create and issue securities the interest on which shall be charged on the revenues of the undertakings transferred after the payment thereout of working expenses, and if and so far as such revenues are insufficient on the Consolidated Fund of the United Kingdom, or the growing produce thereof, and which shall bear interest at such rate and shall be subject to such conditions and regulations as to repayment, redemption, or otherwise as the Treasury may direct or prescribe, and the regulations may apply with the necessary modifications any of the enactments relating to Local Loans Stock.

(5) Where an undertaking is so acquired or established as aforesaid the Minister shall, unless and until he leases the undertaking, operate it in the national interest in such way as he thinks best calculated to give efficient service and facilities, and he shall be entitled to fix such rates, fares, tolls, dues, and other charges as he thinks fit, notwithstanding any statutory provision limiting the amount of such charges or increase therein affecting the undertaking, and shall have all such other powers of management as may be necessary for the purpose:

Provided that the Minister may, if he thinks fit, discontinue the working of any part of the undertaking where he considers such discontinuance is expedient in the national interest.

(6) The expenses of working undertakings acquired or established by the Minister under this section shall be paid out of the revenues of the undertakings, and the Minister shall keep such accounts of the receipts from and expenditure on the undertakings and in such form and those accounts shall be audited in such manner, as the Treasury may prescribe.

(7) Before an Order in Council is made under this section, a draft thereof shall be laid before each House of Parliament for a period of not less than 30 days during which that House is sitting, and if either of those Houses before the expiration of those 30 days presents an address to His Majesty against the draft, or any part thereof, no further proceedings shall be taken thereon without prejudice to the making of any new draft order.

(8) For the purposes of this Act the expression "undertaking" includes any shipping or other services carried on as ancillary to the principal business of the undertaking, and all rights, powers, authorities, and privileges belonging to or enjoyed by the owners of the undertaking in connection therewith, and all property, including cash balances, reserve funds, investments, and all other interests and rights in, to, and out of the property, and obligations and things in action in the possession or belonging to the owners in connexion with the undertaking, or held in trust for purposes connected with the undertaking, and all books, accounts, and documents relating thereto.

POWER TO MAKE ADVANCES FOR CERTAIN PURPOSES.

5.—(1) The Minister may, subject to the approval of the Treasury, *make advances out of the moneys provided by Parliament* to any authority, company, or person, either by way of grant or by way of loan, or partly in one way and partly in another, and upon such terms and conditions as he thinks fit for any of the following purposes:—

(a) The construction, improvement, or maintenance of railways, light railways, or tramways;

(b) The construction, improvement, or maintenance of roads, bridges and ferries;

(c) The construction, improvement, or maintenance of harbours, docks, or piers;

(d) The construction, improvement, or maintenance of canals or inland navigations;

(e) The promotion and improvement of transport services by land or water;

and the power of the Treasury on the recommendation of the Development Commissioners to make advances for any of the purposes aforesaid shall cease and determine.

(2) For the purpose of advances for the construction, improvement, or maintenance of roads the Minister may classify roads in such manner as he thinks fit.

POWER TO REQUIRE STATISTICS AND RETURNS.

6.—It shall be the duty of the owners of any railway, light railway, tramway, canal, inland navigation, dock, harbour, pier, or electricity undertaking, and the authority or person liable to maintain any road or bridge, to furnish to the Minister at such times and in such manner and form as he may direct, such accounts, statistics, and returns as he may require for the purposes of his powers and duties under this Act.

POWER TO HOLD INQUIRIES.

7.—(1) The Minister may hold such inquiries as he considers necessary or desirable for the purposes of this Act, and the Minister and, if authorised by the Minister, the person appointed to hold any such inquiry, may by order require any person, subject to the payment or tender of the reasonable expenses of his attendance, to attend as a witness and give evidence or to produce documents at the inquiry, and if any person fails without reasonable excuse to comply with any of the provisions of any such order he shall be liable on summary conviction to a fine not exceeding five pounds, and the person holding the inquiry shall have power to take evidence on oath and for that purpose to administer oaths.

(2) Notices of inquiries may be given and published in accordance with such general or special directions as the Minister may give.

(3) The powers of the Minister under this section shall be in addition to and not in derogation of any powers of holding inquiries transferred to him from any other Government Department under this Act.

STAFF AND REMUNERATION.

8.—(1) The Minister may appoint such secretaries, officers, and servants of the Ministry as the Minister may, subject to the consent of the Treasury as to number, determine.

(2) *There shall be paid out of moneys provided by Parliament to the Minister an annual salary not exceeding five thousand pounds, and to each of the Parliamentary secretaries of the Ministry an annual salary not exceeding fifteen hundred pounds, and to the other secretaries, officers, and servants of the Ministry such salaries or remuneration as the Treasury may from time to time determine.*

(3) *The expenses of the Ministry, to such amount as may be sanctioned by the Treasury, shall be paid out of moneys provided by Parliament.*

(4) There shall be transferred and attached to the Ministry such of the persons employed under any other Government Department in or about the execution of the powers and duties transferred by or under this Act to the Minister, as the Minister and the other Government Department, with the sanction of the Treasury, may determine.

(5) The Minister may from time to time distribute the business of the Ministry amongst the several persons transferred or attached thereto in pursuance of the foregoing provisions of this section in such manner as he may think right, and those officers shall perform such duties in relation to that business as may be directed by the Minister:

Provided that such persons shall be in no worse position as respects the tenure of office, salary, or superannuation allowances than they would have been if this Act had not been passed.

SEAL, STYLE, AND ACTS OF MINISTER.

9.—(1) The Minister may sue and be sued by the name of the Minister of Ways and Communications, and may for all purposes be described by that name.

(2) The Minister shall have an official seal, which shall be officially and judicially noticed, and shall be authenticated by the signature of the Minister, or of a secretary, or any person authorised by the Minister to act in that behalf.

(3) Upon and by virtue of the appointment of any person to be Minister, the benefit of all deeds, contracts, bonds, securities, or things in action, vested in his predecessor at the time of his predecessor ceasing to hold office, shall be transferred to and vested in and enure for the benefit of the person so appointed, in the same

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manner as if he had been contracted with instead of his predecessor, and if his name had been inserted in all such deeds, contracts, bonds, or securities instead of the name of his predecessor.

(4) Subsections (2) to (4) of section eleven, and subsections (2) and (3) of section twelve of the New Ministries and Secretaries Act, 1916, shall apply to the Minister and the Ministry of Ways and Communications and to the office of Minister of Ways and Communications in like manner as they apply to the Ministers and Ministries mentioned in those sections.

ABILITY OF MINISTER AND SECRETARIES TO SIT IN PARLIAMENT.

10.—(1) The office of Minister of Ways and Communications, or of the secretary in the Ministry of Ways and Communications, shall not render the holder thereof incapable of being elected to or sitting or voting as a member of the Commons House of Parliament, but not more than two such secretaries shall sit as members of that House at the same time.

(2) The person who is first appointed to be Minister shall not by reason of such appointment, if a member of the Commons House of Parliament, vacate his seat as such member.

SHORT TITLE AND INTERPRETATION.

11.—(1) This Act may be cited as the Ministry of Ways and Communications Act, 1919.

(2) In this Act the expression "government department" includes any Government or other public department, and any Minister of the Crown acting as the head of a Government Department, and for the purposes of this Act the Light Railway Commissioners and the Road Board and the Lord Lieutenant and Privy Council of Ireland shall be deemed to be Government Departments.

(3) Any Order in Council under this Act may be altered or revoked by a subsequent Order.

SCHEDULE.

TRANSITORY PROVISIONS.

1.—In the construction and for the purposes of any Act of Parliament, judgment, decree, order, award, deed, contract, regulation, by-law, or other document passed or made before the transfer to the Minister or Admiralty from any other Government Department of any powers or duties by or under this Act, but so far only as may be necessary for the purpose of such transfer, the name of the Minister or Admiralty shall be substituted for the name of the other Government Department.

2.—Where anything has been commenced by or under the authority of any other Government Department before the transfer to the Minister or Admiralty of any powers or duties by or under this Act, and such thing is in relation to the powers or duties so transferred, such thing may be carried on and completed by or under the authority of the Minister or Admiralty.

3.—Where at the time of the transfer of any powers or duties by or under this Act any legal proceeding is pending to which any Government Department is a party, and such proceeding has reference to the powers and duties transferred by or under this Act, the Minister or Admiralty shall be substituted in such proceeding for the other Government Department, and such proceeding shall not abate by reason of the substitution.

UNDERGROUND EFFICIENCY MEETINGS.

The fifth meeting of the fourth series of efficiency meetings of the operating staff of the London Underground Railways and London General Omnibus Company, Limited, was held on February 18, at the L.G.O.C. Training School, Chelsea, Mr. H. E. Blain, operating manager, presiding over an attendance of over 200 members of the central staff of the associated undertakings.

A paper on "Railway Maintenance—Civil Engineering" was read by Mr. Arthur R. Cooper, M.Inst.C.E., Engineer to the Underground Railways, and dealt in an exceedingly interesting and practical manner with the general organisation of the Civil Engineering Department—practice in regard to permanent way, illustrating types of track, rail fractures, sleepers and fastenings, sanitation and drainage, slips and pumps; electrical equipment of track, including notes on voltage, insulators, cable supports, etc.; signalling, including automatic fogging, lamp signals, speed control, and wireless installations, various types of railway works, including bridges, viaducts, the use of ferro-concrete, and general notes on station maintenance; lighting problems, such as the glare effect, variation in intensity, nature of surrounding surfaces, etc.; the ventilation of tube railways, with some interesting notes on temperature, the piston action of trains, etc.; and a description of new works, such as the Earls Court flying junction.

The paper was illustrated with a large number of slides, and resulted in an interesting discussion, which was opened by Mr. A. R. McCallum, chief assistant to the Railway Mechanical Engineer, and Mr. H. L. Stallan, maintenance electrician, Engineering Department, L.G.O.C.

A vote of thanks was accorded to Mr. Cooper on the motion of Mr. Roger Smith, chief electrical engineer to the Great Western Railway, seconded by Mr. H. E. Roberts, London Divisional Engineer to the South Eastern and Chatham Railway.

LIVERPOOL CORPORATION'S SHELL OUTPUT.

A Two Millions Record under the Direction of the Tramways General Manager.

Fine Work of Women.

From June, 1915, to the cessation of hostilities there were turned out from the Liverpool municipal shell factories upwards of 3,000,000 high-explosive shells—an achievement of which the city may well be proud, and one which is all the more creditable in that the bulk of the workers comprised women. We are indebted to the *Liverpool Post* for the following account of the undertaking:—

The genesis of the effort dates back to April, 1915, when the chairman of the Tramways Committee (Alderman Russell-Taylor) and the general manager (Mr. C. W. Mallins) were authorised by the committee to interview the then Minister of Munitions (Mr. Lloyd George), and offer him the use of the Lambeth Road works for the purpose of the manufacture of shells. The interview took place on May 31, and on June 4 Mr. Lloyd George came to Liverpool and addressed a meeting in the Town Hall, at which it was decided to go full steam ahead with the manufacture of shells at the Lambeth Road car works. Great difficulties were encountered at the outset owing to the shortage of machine tools, but patriotism stimulated private firms to come to the rescue and lend lathes and other plant to the Corporation. Shell-making operations were actually commenced on June 21, 1915. It is a noteworthy fact that the Lambeth Road works were amongst the first shell factories in the country to employ female labour. Ultimately the factory utilised no less a proportion than 85 per cent. of female labour. The first lot of 18-lb. high-explosive shells was completed on October 20, 1915, these being the first shells finished and "passed" by any of the national shell factories in the Lancashire area. By July, 1916, the works were manufacturing at the rate of 2,000 18-lb. high-explosives per week. Then there was a hustle, and the output was vastly increased.

An important change ensued a few months later. At the request of the Ministry of Munitions, Lambeth Road works, besides continuing manufacture, became a species of rectification depot for the treatment of shells not fully completed at a large number of small outside factories. The total of outside shells thus rectified or finished varied from 12,000 to 21,000 per week.

The total capital expenditure on the factory, including the purchase and installation of machine tools, was only about £23,000—a remarkably low aggregate. The cost of producing an 18-lb. high-explosive shell in some private factories in the country was 8s. and 9s.; at the Lambeth Road factory the cost was not more than 2s. 2d. per shell.

From the date operations were commenced to the date of signing of the armistice the numbers of shells completely manufactured or rectified and finished were:—

18-lb. high-explosive	1,906,389
4·5 ,, ,, ...	185,696
2·75 ,, ,, ...	40,850
60-lb. ,, ,, ...	6,569
15-lb. ,, ,, ...	1,795
Total	2,141,299

Besides making shells, the Lambeth Road factory has assisted in the manufacture of aircraft. Three hunderd Avro main planes were made, and a second order for 200 main planes of the Sopwith Snipe type was being completed when hostilities ceased. The supervision and management of the factory have been in the hands of Mr. C. W. Mallins, the general manager of the tramways, and Alderman Russell-Taylor has been acting chairman of the committee which has controlled this splendid enterprise.

In addition to the factory of the Tramway Department, the Liverpool Corporation have had another shell-making works at the North Haymarket, under the control of the city engineer, capable of producing 20,000 18-lb. high-explosive shells per week. It will be recollected that King George visited this factory in May, 1917. The total of shells completed and delivered to the Government at this factory was as under:—

18-lb. high-explosive	245,672
4·5 ,, ,, ...	443,211
6-in. ,, ,, ...	303,198
Total	992,081

From the establishment of this factory to its demobilisation 32,252 tons of shells were manufactured.

The total expenditure, exclusive of machines, tools, and other plant bought and paid for by the Liverpool Munitions of War Committee, amounts approximately to £700,000, of which sum £510,000 has been distributed in wages, the weekly wage bill averaging about £3,800

Mr. H. Dickinson, the city electrical engineer, and his staff have rendered great service in connection with the production of this colossal total of over 3,000,000 shells by providing the electrical energy for the power and light.

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THE RECONSTRUCTION & DEVELOPMENT OF EDINBURGH CORPORATION TRAMWAYS.

A REPORT BY THE GENERAL MANAGER, MR. R. S. PILCHER.

I have submitted to the Tramways Committee different reports concerning the present position of the tramway system and the arrangements which require to be made preparatory to the Corporation working the system on June 30 next; I have also reported upon the provision of supplies and the engagement of the necessary staff. I now propose to report to the Tramways Committee on the latter portion of the remit, viz., "The Future Arrangements for Reconstruction and Development of the System,* as follows:—

The last report on this subject was the report by Messrs. Brodie, Hamilton and Campbell, dated October, 1916. This report dealt with various forms of traction, and made certain recommendations, but the most important portion of it was that which dealt with the problem of whether an electric system could be introduced on the expiry of the lease of June 30, 1919.

As the construction of the power station at Portobello was subsequently stopped by the Board of Trade, and it was found impossible to obtain any class of material except for war purposes, the question of electrification of the system was postponed until after the declaration of peace.

The problem is now somewhat different from what it was in October, 1916, inasmuch as the Corporation will be shortly operating the system, and will have free access to the rails and properties for any change which the Corporation may decide upon.

The problem appears at present to resolve itself into the following questions, all of which I propose to deal with:—

(1) Whether the cable system is to be retained, or whether it is to be superseded by some other form of traction?

(2) Which form of traction should supersede the cable system?

(3) Assuming that electric traction is to be adopted, when should the conversion and reconstruction commence?

(4) In what manner should conversion and reconstruction be carried out?

(5) Which of the proposed extensions and developments should be carried out at the time of reconstruction?

I.—WHETHER THE CABLE SYSTEM IS TO BE RETAINED, OR WHETHER IT IS TO BE SUPERSEDED BY SOME OTHER FORM OF TRACTION?

The disadvantages of the cable system are so apparent to the citizens of Edinburgh that I hesitate to enumerate or enlarge on them, but I think it would be as well to mention some of them in order to form a comparison with an electric system.

The cable cars are not well lighted; oil headlights are used, and acetylene gas for the interior. The platform, stairs, and top deck of open cars are not lighted. The acetylene lights are intense to the eye, and they frequently leave an unpleasant odour. Electric cars can be well lighted with a soft light, whilst platforms, top decks, and stairs can be easily lighted and different signal and route lights provided.

Cable cars are not easily controlled; the cars are stopped by a hand lever brake, which in emergency is slow in action. The cable car cannot be reversed, which in operation is a great disadvantage. Electric cars can be easily adapted for different kinds of power emergency brakes, which, when operated efficiently, reduce the number of accidents. Electric cars can be reversed, and when breakdowns or blockages occur this proves of great convenience in rearranging the services.

The type of lifeguard fitted on to the cable cars is not automatic in its action. On the electric cars there is no difficulty in fitting an efficient automatic lifeguard, and this apparatus would be the means of preventing many serious accidents.

It is possible, with care, to operate cable cars smoothly, but it is noticeable in practice that the cars frequently jerk violently when the gripper is taking hold of the rope. This is dangerous to passengers who have just boarded the cars, and have not had time to be seated, or who are in the act of mounting the stairs.

The cable system requires the exercise of great care on the part of the drivers; especially is this so when nearing the junction and curves where it is necessary to change the gripper from one rope to another. If the gripper is not released at the proper time the rope is cut. The care which is required causes delay in approaching the junctions, and consequent congestions. It is particularly noticeable at the Post Office junction, at the St. Andrew Street and Princes Street junction, and at the West End. The delay is not only annoying to the passengers, but it adds to the number of cars required for a given service, and consequently increases the operating expenses. Owing to this congestion at the Princes Street junctions, the cable system as laid out in Edinburgh has reached its limit. On Saturdays, and at other busy times, when over 170 cars are in operation, it is noticeable that there are numbers of cars waiting to take the curves. On some of the curves the auxiliary ropes are not used, and in consequence require a dangerous speed to be obtained by the car in order to be carried by its own momentum to the correct stopping place. In the event of the car stopping short, it is a familiar sight to see a dozen tramways' employees manipulating bars and pushing the car to its correct place. The traffic in Edinburgh has increased to such an extent that the cars are unduly crowded at certain times; yet if more cars were placed along the routes which run along Princes Street no more passengers could be carried owing to the headway limit having been reached at the junctions. With the overhead electric system no delay would be experienced at these junctions.

One of the disadvantages of the cable system is the time taken to turn a car at a crossover; the number of cars which can be turned on a busy route is strictly limited. It therefore follows that more cars are sent to the extreme terminus than is warranted by the traffic, whilst within the mile radius of the centre of the city there are insufficient cars for the public requirements. This delay is noticeable at Salisbury Place and at Morningside Station. Electric cars can be speedily turned when and where required, and in consequence the exact traffic requirements are more easily and efficiently provided for.

The capital cost of the cable system is very heavy compared with other forms of traction, and this adversely affects proposed extensions; new lines would only be warranted where the traffic was dense. On the other hand, an electric scheme lends itself to extensions, and the forms of construction can be cheapened when passing through rural districts.

The outstanding effect of the cable system is that when a cable becomes stranded or cut it causes a whole route to be stopped for four or five hours. This disorganises the life of the city, because in these days the citizens depend very largely upon the tramway system. Such breakdowns are unknown in connection with an electric system.

I might mention other disadvantages which are more or less apparent to the public, but I think that the facts I have indicated are sufficient to show that the cable system has fulfilled the most that it is capable of, and as the traffic of the city of Edinburgh is likely to increase more in the future, the inconvenience, delays, and breakdowns would become correspondingly more pronounced. In these circumstances I have no hesitation in recommending the committee to discontinue the cable system and to adopt a more reliable and progressive form of traction.

II.—WHICH FORM OF TRACTION SHOULD SUPERSEDE THE CABLE SYSTEM?

This question was very fully dealt with in the report of Messrs. Brodie, Hamilton and Campbell. In this report they dealt with electric traction, overhead, conduit, and surface contact systems, also "self-propelled" vehicles and motor omnibuses. The conclusion they came to was "that the overhead electric system is the most reliable, convenient, and economical system which can be provided to adequately fulfil all the demands of the city of Edinburgh and its suburban area." With this conclusion I am in complete agreement. There are, however, some special features which require consideration in applying this system to the Edinburgh tramways, with which I propose to deal.

OVERHEAD EQUIPMENT.

There are several types of overhead equipment construction:—

(1) Span wire.

(2) Centre pole.

(3) Side pole and bracket arm.

The span wire construction is used where there is an objection to centre poles, and where the roadway is too wide to use bracket arms. The span wire is attached to supporting columns on either side of the roadway. Where there are buildings available the span wire is attached to the buildings by means of brackets called rosettes, and this avoids the erection of poles on the pavement. This form of overhead construction is simple and efficient in operation. The span wire form of construction I would recommend to the committee for all parts of the system with the exception of Leith Walk and Princes Street. In Leith Walk the roadway is particularly wide (23 yards), and is not suitable for span wire construction. I would therefore suggest to the Committee the advisability of continuing the centre pole construction, which is the same form of construction as is used by the Leith Corporation. This would harmonise with the existing electric light scheme in this thoroughfare. The electric light standard could, if desired by the Electric Lighting Committee, be replaced by steel poles suitable for the suspension of tramway wires. The electric light could then be fitted on to the top of the columns. This arrangement would continue up to Broughton Street, where the span wire construction would start.

*Motion by Councillor Harrison and Dean of Guild Neil M'Leod:—

Remit to the Tramway Committee to consider and report as to the present position of the tramway system generally, the arrangements which require to be made in view of the management of the tramways being undertaken by the Corporation on the expiry of the tramway lease on June 30 next, including the provision of necessary supplies and equipment, the engagement of the necessary staff, and other matters connected with the establishment of a Tramway Department, and also the future arrangements for reconstruction and development of the system, with power to obtain a report or reports from the tramway manager, Mr. Pilcher, on these matters.

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PRINCES STREET.

The problem of the Edinburgh tramway system has always been centred round Princes Street. This is but natural; such a street, unrivalled in its beauty and in its unique setting, both of historical interest and natural beauty, is bound to receive very careful consideration from the civic authorities. At the time when Edinburgh adopted the cable system it was probably this question more than any other which influenced the Council in favour of the cable system. The problem now is whether the electric conduit or overhead electric system is to be installed. If the electric conduit is installed, the cost of this line would be double what an ordinary overhead system would cost, and in addition the whole of the rolling stock would require to be provided with dual wiring and collectors for both the conduit and overhead systems; however, this is not the greatest objection. At the west end of Princes Street there would be three junctions; at the east end there would be three junctions; and three intermediate junctions would be required for the routes which would probably join up with Princes Street—making in all nine junctions (Fig. 1). At each of the junctions where regular services are operated it would be necessary to provide movable ploughs, which would be fastened on to the cars as they proceed on to Princes Street, and which would be uncoupled when they left Princes Street. During the time the plough or collector is attached, the trolley pole would be locked down and out of use. This is the system now adopted in London after considerable experience with the dual system.

The change from one system to the other at the junctions means delay, and materially affects the efficiency of the whole system, in addition to which the cost of providing pointsmen at the junctions would be not less than £800 per annum. With the conduit system there is also greater risk of breakdowns due to water, snow, and damaged ploughs than there would be with the overhead, and the risk of breakdown would probably necessitate the building of an emergency line of tramway along George Street. If the Council decided to instal the conduit system in Princes Street, overhead wires would require to be temporarily erected from centre poles until such times as the cable conduits could be removed and the electric conduits built.

If the overhead system is to be used there are two methods of arranging it, either to adhere to the present position of the track and erect overhead wires from the centre poles, or to build the new track on the south side of the street and to suspend the overhead wires on artistic side columns fitted wth bracket arms; the latter arrangement would be preferable, the standards being close to the foliage. This plan would provide a wide street for vehicular traffic, suitable islands being left at the crossings. One advantage with this scheme would be that the permanent way could be finished and ready to connect up at the east and west end as soon as this section of the cable system was ready to be converted.

After giving this question careful consideration, I personally would favour the scheme which places the tramway along the south side of the street, with overhead wires. However, it is for the Corporation and the citizens to decide this question, keeping in view that the conduit will never give the same satisfaction, and the system will be subject to annoying delays in the very heart of the city. The London County Council operate the dual system, but find it very unsatisfactory, and have decided to equip all new lines with the overhead system. Edinburgh, after its recent experiences, should be equipped with the most efficient system of traction; indeed, if it is not, the privately owned motor omnibuses may enter into active competition for the local traffic.

Any proposal to withdraw the cars from Princes Street in favour of George Street should not be seriously considered, because I am convinced that the great majority of passengers wish to pass to and from their destinations *via* Princes Street, which at present has also a heavy short-distance traffic. To withdraw the tramways from Princes Street would simply be to encourage the motor omnibus traffic along this street.

III.—ASSUMING THAT ELECTRIC TRACTION IS TO BE ADOPTED, WHEN SHOULD THE CONVERSION AND RECONSTRUCTION COMMENCE?

I believe that if the citizens of Edinburgh were to express an opinion on the above question it would be "as soon as possible." However, I propose to deal with several points which require consideration in answering this question.

In another part of this report I have pointed out that the cable system as at present constructed has reached its limit in the city of Edinburgh, and I have indicated the reasons why. The traffic of the future could not be handled without radical movement being introduced in order to remove the causes of congestion in Princes Street; this constitutes one reason for conversion as early as possible.

With reference to rolling stock, it is not at all probable that the committee would seriously consider the provision of more rolling stock and shed accommodation suitable for the cable system, and therefore there are strong reasons for at once proceeding with the electrification of a portion of the undertaking in order to provide additional cars. The top-covered cable cars so displaced by the new electric cars could be used to improve the service on the other routes until such times as these sections could in turn be electrified.

There is the financial aspect of this question to consider. The total capital expenditure incurred on the undertaking up to May 15, 1918, is £1,594,806. The amount which is expected to be outstanding on June 30, 1919, will be fully £400,000, to which has to be added the cost of cars, stores, etc., taken over from the Tramway Company. This would be a large amount of debt to add to a new electric undertaking if it did not represent real tangible assets. For the information of the committee I show some items of the capital expenditure on the present system:—

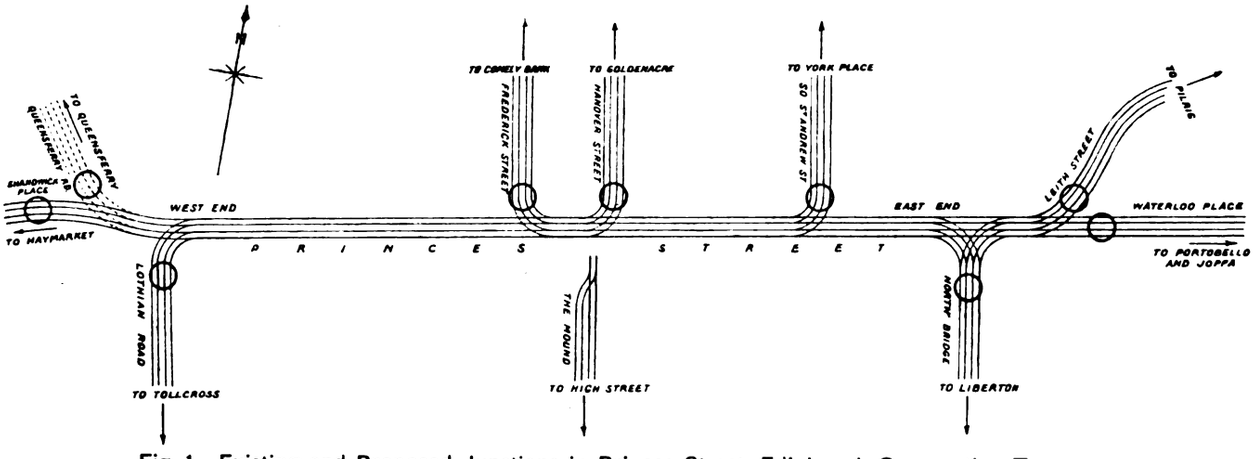

Fig. 1.—Existing and Proposed Junctions in Princes Street, Edinburgh Corporation Tramways.

Permanent way	£466,775
Buildings	173,983
Lands	29,583
Heritable properties	15,236
Electric tramways	13,267

It must be remembered in connection with the permanent way that some of the routes will last for some years before requiring renewal, whilst the heavy concrete foundations and paving setts are a valuable asset.

The power-stations and car-shed buildings, with alterations, will be suitable for the electric system, and will be capable of housing at least as many, if not more, cars than the present buildings, as well as providing for an extended workshop at Shrubhill. When these facts are appreciated, and considering that the city owns a trading concern which is capable of earning £400,000 per annum, and providing over £100,000 per annum towards interest, depreciation, and sinking fund, I do not think there should be any hesitation from a financial point of view in starting the electrification of the system. It will take several years before the whole system can be electrified. By the time the last of the cable cars stop running I believe that most of the debt of £400,000 will have been redeemed.

The construction of the Portobello electric power-station is now proceeding, and I understand that electric current for tramway purposes will likely be available within two years from this date. I would recommend the committee to obtain the necessary power for reconstruction and the building of extensions, so that contracts could be let for permanent way, cars, and alterations to buildings. The electrification of the system should proceed concurrently with the building of the power system; there would then be no time lost in providing the citizens with an improved tramway service.

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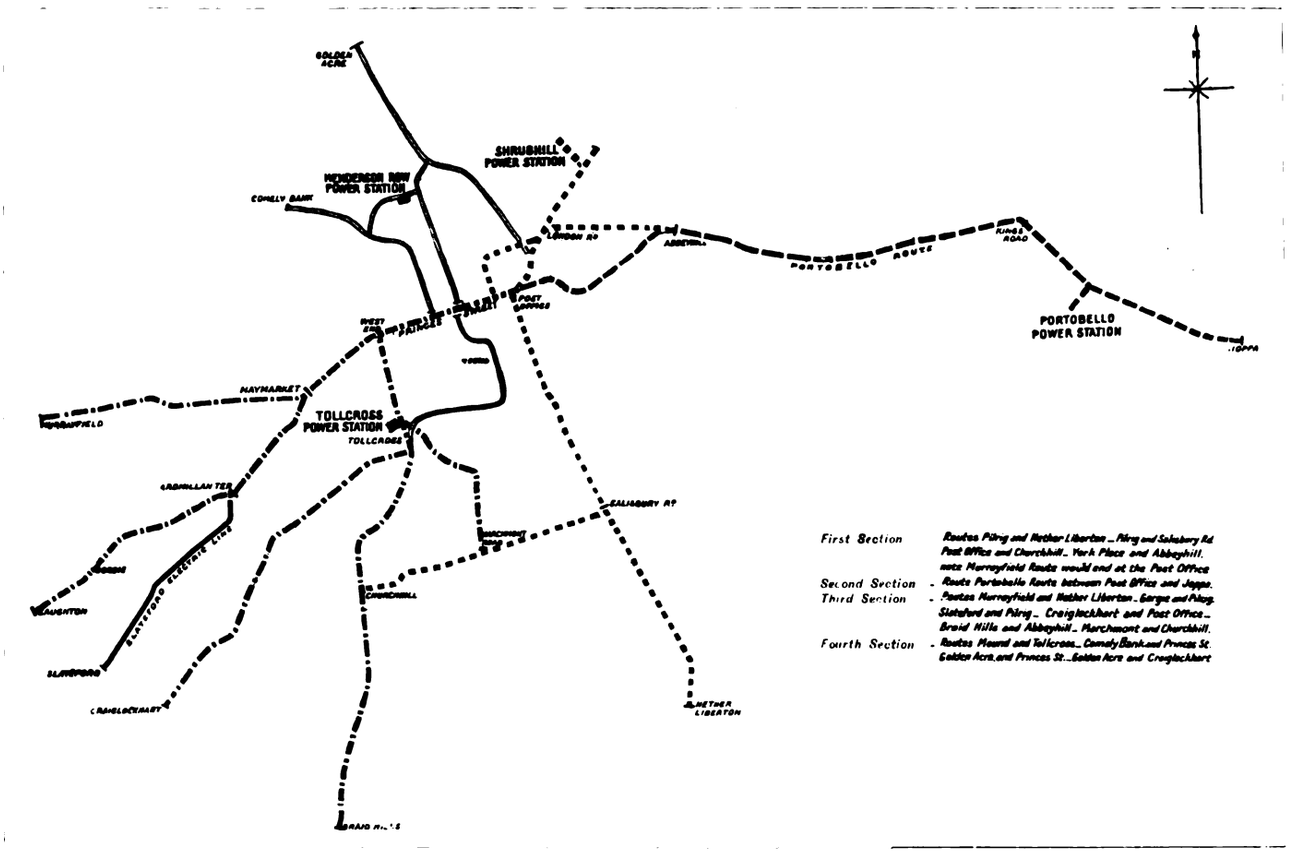

Fig. 2.—Edinburgh Tramways showing Proposed Order of Electrification.

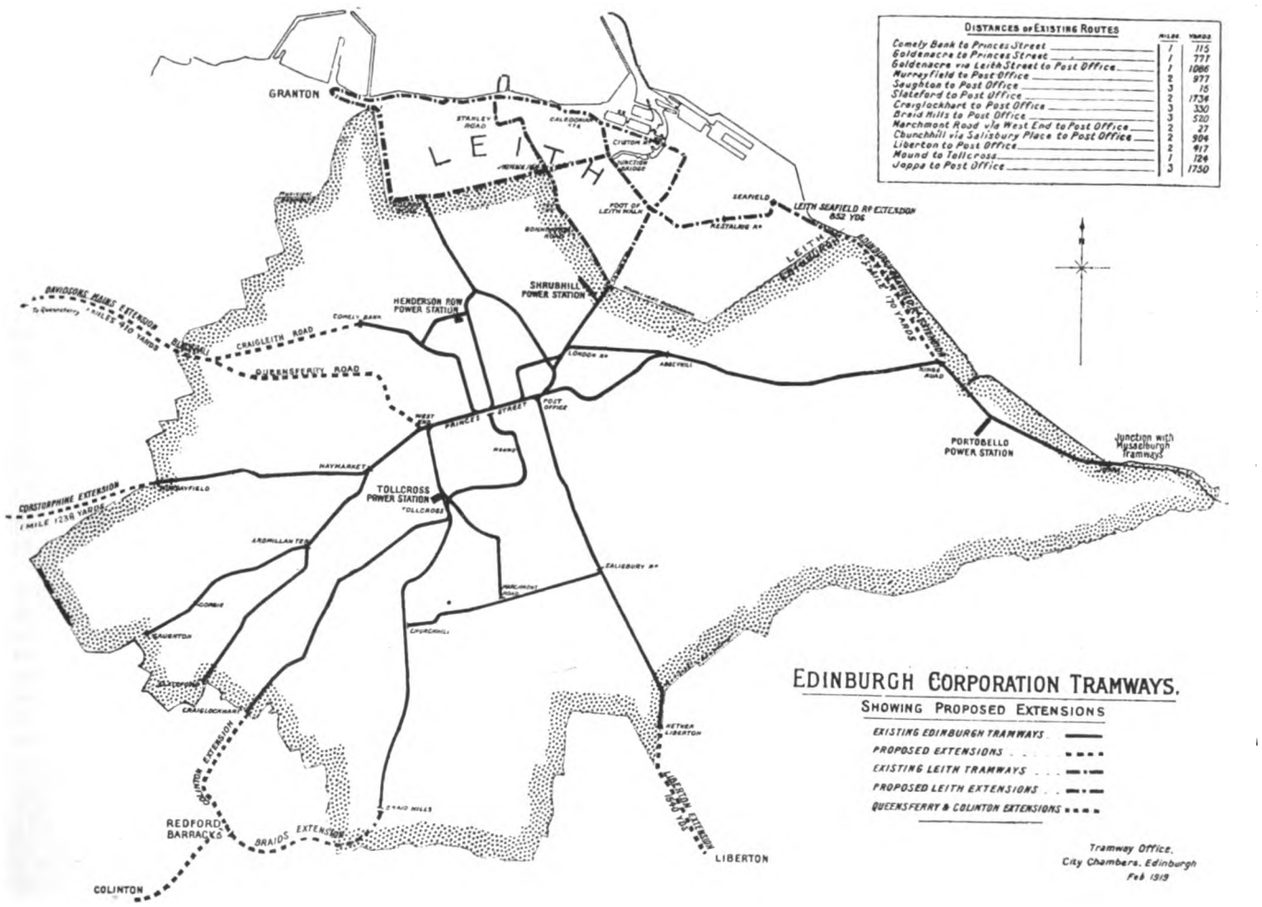

Fig. 3.—Edinburgh Tramways and Proposed Extensions.

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IV.—In What Manner should Conversion and Reconstruction be Carried Out?

In considering the question of conversion of the cable system to that of the electric overhead system, the change must be carried out without stopping the traffic, and with as little dislocation of the existing routes as possible. The whole system could not be converted at once to an electric system without providing new temporary car sheds, workshops, 250 new cars, and the provision of large generating plant. Many miles of permanent way would also require renewing at once, and this work could not be done in a few months.

I have given the question careful consideration, and have come to the conclusion that the most efficient and economical way of electrifying the system would be to deal with the conversion in sections. This would enable all of the existing buildings to be utilised. It would remove the necessity of building new sheds and workshops, and it would also give sufficient time to renew the permanent way where required.

In considering the grouping of the sections to be electrified, they are naturally divided into four, to correspond with the four cable power-stations. In arranging for the different routes to be electrified it is more suitable to deal with the routes operated from one power-station, so that as each section is finished the power-stations could be shut down, and the buildings and car-sheds could then be made suitable for the accommodation of the workshop. With an electric tramway system the workshop would require to be more extensive than the existing workshop used by the Tramway Company, and as the Shrubhill depot appears to provide both a suitable site and buildings for this purpose, the first section to be dealt with would require to be the section operated from this power-station. I would therefore suggest that the first routes to be dealt with should be from Pilrig to Nether Liberton, Salisbury Place to Churchhill, and St. Andrew Street *via* York Place to Abbeyhill (Fig. 2). The extension mentioned in Section 5 of this report, from Nether Liberton to Liberton, could be built at the same time; the service of cars would run from Liberton to Post-Office, Salisbury Place to Pilrig, and Churchhill to Post Office. The section from St. Andrew Street *via* York Place to Abbeyhill would require to be temporarily run as an independent route until Princes Street is dealt with. Murrayfield route would stop at the Post Office.

The Shrubhill depot would be made suitable for both electric cars and cable cars; the north side would be used for the electric cars, and as the electric scheme increased the accommodation for cable system would decrease. A new entrance for the electric cars could be made *via* Dryden Street. As soon as the Shrubhill power-station is shut down this portion of the depot would be altered and made suitable for the main workshops for the electric cars.

The second, third, and fourth sections to be electrified are shown on Fig. 2, and the speed at which these conversions could be carried out would depend upon the time taken to convert the buildings, and the time taken to renew the permanent way. The rails would require to be bonded with copper bonds to provide for the return of the negative feeder, cables would be laid, and the overhead equipments would require to be erected, but this work would be speedily carried out and would not cause any delay.

The present condition of the permanent way is likely to cause some concern. Some of the rails are worn out and the wheel flanges are not running clear. If electrically-propelled cars are to be introduced these rails could serve only for the period of transition until the new and heavier rails could be laid down. Under such conditions the new rails could be more satisfactorily laid after the electric cars are running; this would permit of a more substantial and durable construction than is possible while the cable system is running; it would also enable the cable conduit to be removed. The great advantage of renewing the rails during the running of an electric system is that the cars can be diverted temporarily to the side of the street whilst the renewal or reconstruction work in the centre is being carried out.

The provision of rolling stock is a very important question. After all it is the condition of the cars which affects the passengers most. I believe that the most suitable car for Edinburgh would be a car to seat about sixty passengers. I am of opinion that more than this could not be efficiently handled by one conductor.

The cars should be well finished, well lighted, ventilated, and suitable for Edinburgh conditions. The seating accommodation should not be unduly crowded as it is on the present cable cars. The cars should be vestibuled for the protection of the drivers, and provided with extra entrances and exits for use during busy times. Magnetic track brakes should be provided on all cars, but on the cars which require to run on heavy gradients special mechanical track brakes should be equipped. A car to seat sixty passengers does not require to be fitted with a double bogie. A single truck with a wheel base of 7 ft. to 8 ft. would give steadiness and would traverse the curves with perfect freedom, and would run with considerably less noise than if equipped with double bogie trucks; the wear and tear on the single truck is also less, and the current consumption would be less. Undoubtedly the double truck would take the curves more smoothly, but the troubles caused by double bogies, and the disadvantages mentioned, compel me to recommend the single truck as the more suitable for city service.

The comparative shed accommodation for cable cars and electric cars at the different depots is shown as follows:—

	Cable Sheds.		Converted for Electric Cars.
Shrubhill	134	...	165
Tollcross	54	...	92
Portobello	22	...	45
Henderson Row	34	...	40
Present	244	Future	342

It will thus be seen that the existing properties can be utilised so as to be valuable assets to a new scheme of electric traction.

V.—Which Extensions and Developments should be Carried Out during the Period of Reconstruction?

The two following extensions (Fig. 3) have been authorised:—

	Route Mileage. Miles.	Yards.
Murrayfield to Corstorphine	1	1,238
Braid Hill to Redford	1	594

The Corstorphine extensions will provide great convenience, and will develop a large amount of new traffic in connection with the Murrayfield route. I would recommend that this extension be built during the period of reconstruction.

The Braids extension would provide transit facilities to the Bedford Barracks. There is no doubt that the natural extension to the barracks should be from Craiglockhart terminus, but as Parliamentary sanction has been withheld, I think in the meantime the Braids route should be deferred until further consideration can be given to the question of the proposed extensions from the Craiglockhart terminus.

Other Proposed Extensions.

Nether Liberton to Liberton route mileage, 1,540 yards.

This proposed extension is a natural one, being populated the whole of the way. Many of the people from this district walk to the Nether Liberton terminus, but use the motor omnibus when there is accommodation. This extension is very necessary, and would be much appreciated in this district. It would also help to open up building operations for what is a beautiful and desirable site for a Garden City scheme. I would suggest to the committee the desirability of obtaining the necessary powers for the construction of this extension.

King's Road, Portobello, to Seafield Road (at Edinburgh and Leith boundary) route mileage, 1 mile 157 yards.

In connection with the above proposed extension, it might be necessary for the Leith Corporation to build the tramway along Seafield Road and to connect up with their existing line to Pilrig.

The extension of the Burgh of Leith would be 852 yards, making the new tramway 1 mile 1,009 yards. At the present time the passengers in North Edinburgh and Leith who desire to proceed to Portobello have to travel *via* Waterloo Place. A great many people residing in Leith travel by the Leith car to Seafield terminus, and then walk along the Seafield Road to Portobello. It is an undoubted fact that there would be a large tramway traffic between the industrial populations of Leith and Portobello during the summer months. This extension is required to relieve the Portobello route, which is already overcrowded at holiday times, and with greater facilities in the future the traffic will become heavier. In these circumstances I believe the proposed extensions would not only develop new traffic to Portobello, but would greatly relieve at busy times the traffic to Portobello *via* Waterloo Place.

Mutual running arrangements would require to be made with the Leith Corporation which would enable through passengers being conveyed from Stanley Road, Leith, to Joppa. I would recommend the construction of this line during the period of reconstruction.

Comely Bank to Davidson's Mains route mileage, 2 miles 410 yards.

The proposed extension from Comely Bank terminus along the Craigleith Road to the junction of Queensferry Road is a natural and necessary extension of the Comely Bank route. There are houses practically all the way. This thoroughfare and this section of the city should be provided with transit facilities. From the junction of Craigleith Road and Queensferry Road it is but a short distance to Blackhall, and still further on there is Davidson's Mains.

These villages, although situated outside the city boundary, are practically suburbs of Edinburgh, and have an intimate connection with the city. I believe this district would, if provided with proper facilities, develop a large traffic to and from the city, and would be a useful and profitable extension to the Comely Bank route. If and when the Queensferry tramway is constructed the villages of Blackhall and Davisdon's Mains would naturally receive facilities from that route. The Comely Bank cars would, in these circumstances, stop at the junction of Craigleith Road and Queensferry Road. I beg to recommend that power be obtained for the construction of this extension.

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QUEENSFERRY TRAMWAY.

The Corporation have already agreed to apply for powers to construct an electric tramway system from the city to Queensferry *via* the Dean Bridge, so that it is unnecessary for me to deal with this proposed extension here.

AUXILIARY ROUTE TO PRINCES STREET.

I wish to draw the committee's attention to the consideration of auxiliary routes to Princes Street. In connection with the Princes Street tramway, in another part of the report I suggest that if an electric conduit system is constructed in Princes Street that an auxiliary track should be laid along George Street on the overhead system, in order to provide against breakdowns on the Princes Street section. Outside of the question of the particular form of construction for Princes Street, an auxiliary route to Princes Street is worthy of consideration now in view of the amount of traffic which will develop in the future. An additional connection between the east and west of Edinburgh could be made either by way of York Place, Queen Street, Glenfinlas Street, and Hope Street to the West End, or by way of York Place, St. Andrew Square, George Street, and South Charlotte Street to West End.

I believe that if the alternative cars of certain West End routes were to be diverted along either of the suggested routes, there would be a slight gain in time, but this would be nullified to some extent on the Queen Street route owing to the gradient in Glenfinlas Street.

Of the two routes the George Street route appears to have the greater advantage. George Street is very largely a shopping street, and would have a heavier tramway traffic than Queen Street, and, being so much nearer Princes Street, would be more effectual as an auxiliary route. If the George Street line were constructed, a convenient route might be run from Comely Bank *via* George Street, St. Andrew Square, and, if necessary, could be connected up with Princes Street. The Goldenacre cars could proceed *via* George Street and South Charlotte Street to the West End. The George Street line would have the advantage of forming a connection with the Comely Bank and Goldenacre routes at the top of the hill, whereas the Queen Street line would require to be joined with the two northern routes on a heavy gradient, which is a distinct disadvantage.

Of the two auxiliary routes considered, I would certainly prefer the route along George Street, but this question very largely depends upon the policy adopted by the Corporation with regard to Princes Street, so that in the meantime I do not intend to make any recommendations with reference to an auxiliary route.

DEVELOPMENTS.

In addition to the particular extensions mentioned, which are urgently required, there are other districts adjacent to Edinburgh which require improved transit facilities with the city. These districts, which include Dalkeith, Lasswade, Penicuik, and Gorebridge, also Colinton and Juniper Green, should be connected up with the city system, and now that the Government realise the importance of cheap electric power and improved transit facilities, there are good prospects for the future development of the transit facilities between the suburban districts and the city of Edinburgh.

The conversion of the system will open the way for other developments, but I have deemed it desirable to leave over consideration of these meantime.

MOTOR OMNIBUSES.

The motor omnibus traffic passing into the city of Edinburgh is extensive, and in the future it is likely to develop considerably. In connection with the development of the City's tramways service, it becomes increasingly evident that the motor omnibus will be required in some districts to develop the traffic prior to the laying of the tramway lines, and in some cases to run services in conjunction with the tramway system. The question of motor omnibus services running through the city of Edinburgh is intimately connected with the future transit problems of the city, and it appears to me that it is desirable for the city to obtain Parliamentary powers to operate motor omnibuses in conjunction with their tramway system outside the city boundaries. This power has been obtained in other towns where motor omnibuses are being operated by the Corporation tramway system, among which may be mentioned the following:—

	Powers.
Sheffield ...	Running powers for eight routes as far as six miles beyond the city boundary.
Walsall ...	Running powers for five routes running as far as six-and-a-half miles beyond city boundary.

The extensions to the tramway system which are proposed cannot be constructed at the earliest for two years; in the meantime these extensions could be temporarily operated by motor omnibuses. There are other routes on which motor omnibuses might be run to advantage, but consideration of these can be taken up later.

The Corporation already have obtained Parliamentary sanction to operate motor omnibuses within the city, and in fact did institute a service of motor omnibuses during the early months of the war, but owing to the fact that the omnibuses were not under direct control, and that the scope and routes of the omnibuses were strictly limited by agreement with the tramway company, there was little chance for them to have proved a success.

With the Corporation operating their own system, the position is entirely changed. There will be a distinct scope and promising field for the operation of motor vehicles. In addition to the temporary services over proposed extensions, motor omnibuses would be useful to supplement the existing services at certain points; they would also be useful in cases of breakdown of portions of the cable system, and for special purposes.

With these objects in view, I would ask the committee to consider the advisability of at once acquiring some motor omnibuses.

VI.—SUMMARY OF RECOMMENDATIONS.

(1) That the cable system should be discontinued.
(2) That the system should be electrified, and that the overhead electric system should be adopted.
(3) That Princes Street should be specially treated by placing the tramway on the south side of the street, with side pole overhead construction.
(4) That preparations for conversion and reconstruction should be made at once.
(5) That conversion and reconstruction be carried out in sections as indicated.
(6) That powers be obtained for the construction of the extensions recommended.
(7) That a number of motor omnibuses should be acquired as soon as possible, and that Parliamentary powers should be obtained for operating motor omnibuses in conjunction with the tramway system outside the city boundaries.

In reporting to the committee on the question of the reconstruction and development of the system, I have, whilst going into many details, avoided detailed estimates, and have endeavoured to deal with the subject in a general way. I think it is desirable that the Council should declare its future policy as soon as possible. Detailed estimates can then be prepared for permanent way, alterations to buildings, provision of new cars, etc.

MANUAL OF ELECTRICAL UNDERTAKINGS.*

Again we have the invaluable and indispensable "Garcke" with us, bigger and more useful, if possible, than ever. The introductory matter to this year's volume, as usual, contains a mass of general information brought well up to date except in those cases where circumstances arising out of the war have prevented the issue of statistics. In these instances the latest available figures are recorded, along with the comparisons with previous years. The introductory articles in this and the previous annual volumes form a valuable record in the history of British electrical industries, and the list which is given of these articles, including surveys of the year, becomes longer and more useful as time goes on. In view of the promised legislation for the establishment of a national electric power supply in this country, readers will find much convenience from the fact that the reports of the Coal Conservation Committee and the Electric Power Supply Committee which were published last year are included in the volume. It is on these reports, with their proposals for a Board of Electricity Commissioners and District Electricity Boards, that the forthcoming legislation will be based. Hence the value of having the reports in handy form for reference.

As to the general scope of the book this year, it contains statistical and general information relating to about 3,000 electrical undertakings in the United Kingdom and in British possessions abroad. The aggregate capital issued by electrical companies registered in Great Britain, together with the amounts borrowed by municipalities for electrical undertakings (but excluding the capital for Government telegraphs) was last year £489,101,584, which is an advance of nearly fourteen millions on the preceding year. The first volume of the "Manual," published in 1896, contained particulars of 200 undertakings, with a capital of £61,109,525. The statistical tables of financial results, etc., are as usual full and elaborate. One or two items in regard to traction undertakings may be quoted. The total capital issued by electric tramway and railway companies is at present £189,576,073, and the figure is a steadily increasing one from year to year. The amount of capital expenditure by municipalities on electric traction is £53,800,606. The amount has not advanced much during the last four years.

The bulk of the book is, of course, taken up with the particulars of each individual undertaking, and the sectional and alphabetical orders make reference most convenient. A feature of the book has always been its maps, and on this occasion there are over 50 of these, showing the principal tramway and electric railway systems and power undertakings of the United Kingdom and the Dominions. The national electric power proposals now in the air give special interest to the maps of existing power distribution undertakings. The directory of officials, which forms a valuable feature of the work, now embraces about 20,000 addresses. Another section relates to electrical contractors.

* Manual of Electrical Undertakings and Directory of Officials, 1918-19. Compiled under the direction of Emile Garcke, M.I.E.E. Vol. XXII. London: Electrical Press, Limited. 1,715 pp., 22s. 6d. net.

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LONDON TRAMWAY EXTENSIONS.

NEW AND LINKING UP LINES IN AND NEAR THE CITY.

The London County Council on February 18 approved the recommendation of the Highways Committee that Parliamentary powers should be sought in the present session of Parliament for the linking up and extension of the tramways. All the extensions proposed were contained in a scheme submitted in 1914. The lines are urgently required, and the Committee recommended that they should be proceeded with at the earliest possible moment. In spite of the high cost of the work under present conditions, each of the proposals will be of immediate financial benefit to the undertaking. In only two cases will the work involve street widenings. Three of the proposals are for linking up or abolishing dead ends, two being complementary to each other for the purpose of linking up the southern tramways at Blackfriars Bridge with certain routes on the northern system. The need for satisfactory connections allowing the passage of double-deck cars between the northern and southern systems is well understood. The remaining three proposals provide for the extension of existing central terminals nearer to large traffic centres. The following list gives particulars of the six lines proposed :—

Description of Tramway.	Length (Single Line).	Estimated Capital Cost.
	m. f. c.	£
(1) Charles Street to Blackfriars Bridge *via* Farringdon Road, Farringdon Street, and New Bridge Street	1 3 1	83,490
(2) Gray's Inn Road to Farringdon Street *via* Holborn and Charterhouse Street	0 5 6	50,700
(3) Aldgate terminus to Aldgate Station *via* Aldgate High Street	0 1 1	22,490
(4) Hampstead Road to Oxford Street *via* Tottenham Court Road	1 2 7	79,760
(5) Seven Sisters Road to Stamford Hill *via* Amhurst Park ...	1 2 6	52,160
(6) Southampton Row to New Oxford Street *via* Vernon Place and Hart Street	0 3 6	30,890
	5 2 7	£319,490

(1) Charles Street to Blackfriars Bridge *via* Farringdon Road, Farringdon Street, and New Bridge Street. Length of tramway, about 5 furlongs 5 chains of double line. Estimated cost of construction and equipment on the underground conduit system of traction, £83,490. This proposal, in conjunction with the next, was submitted to the Council in a slightly different form on November 10, 1914. The construction of this tramway would afford a connection between districts north and south of the Thames by double-deck cars, and would be of the utmost importance. The present dead end in Farringdon Road would be removed, and direct services run to Ludgate Circus from Islington, King's Cross, Highbury, and Highgate on the northern and from almost every point on the southern system. The line would prove of great benefit to large numbers of passengers travelling to and from the important business centres round Fleet Street and St. Paul's Churchyard. The present congestion at Blackfriars would also be relieved by passengers being conveyed direct from their places of work instead of being concentrated at one point. The Council already has power to construct a junction between the tracks in Farringdon Road and Clerkenwell Road; and this junction will greatly increase the utility of the proposed connection between the northern and southern systems.

(2) Gray's Inn Road to Farringdon Street *via* Holborn and Charterhouse Street. Length of tramway, about 2 furlongs 3 chains of double line. Estimated cost of construction and equipment on the underground system of traction, £50,700. This proposal, in conjunction with the previous one, was submitted to the Council in a slightly modified form on November 10, 1914. It will provide another connection between the tramways north and south of the Thames. The present dead end at the junction of Gray's Inn Road and Holborn will be abolished, and it will be possible to run cars from Gray's Inn Road along Holborn and Charterhouse Street and north *via* Farringdon Road and *vice-versa*. It will also enable services to be operated direct to Holborn Circus, and provide access by tramway to the important shopping district between Holborn Circus and Gray's Inn Road.

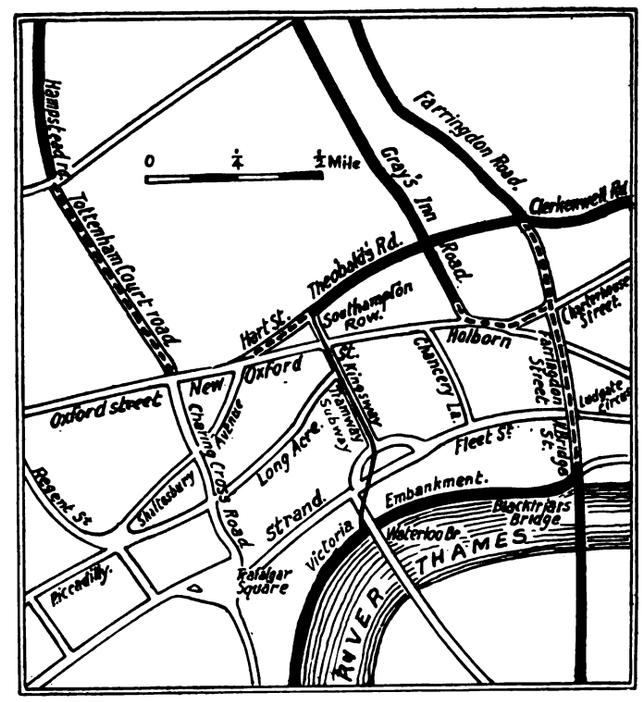
(3) Aldgate terminus to Aldgate Station *via* Aldgate High Street. Length of tramway, about 5 chains of double line and 1½ chains of single line. Estimated cost of construction and equipment on the underground conduit system of traction, £22,490. This proposal was one of those submitted to the Council on November 10, 1914. Although only a short extension, this tramway would be of great service in conveying passengers nearer to the heart of the city than is the case at present. Serious delay is caused at the present terminus by the Whitechapel hay market, and the free access of passengers to and from the footways is obstructed by costers' barrows.

(4) Hampstead Road to Oxford Street *via* Tottenham Court Road. Length of tramway, about 5 furlongs 3½ chains of double line. Estimated cost of construction and equipment on the underground conduit system of traction, £79,760. It is highly important that tramway passengers should be brought nearer to the real traffic centres than is now possible. Tramway passengers desiring to reach points in Tottenham Court Road have at present, in some cases, to walk considerable distances. The proposed tramway should also create new traffic to and from the terminus at Oxford Street.

(5) Seven Sisters Road to Stamford Hill *via* Amhurst Park. Length of tramway, about 6 chains of double line on the underground conduit system of traction, and 4 furlongs 7 chains of double line on the overhead system. Estimated cost of construction and equipment, £52,160. This proposal was one of those submitted to the Council on November 10, 1914. This tramway would connect the existing terminus at Stamford Hill with Manor House and Finsbury Park, and provide direct tramway facilities between the districts of Hackney and Clapton and those of Finsbury Park, Holloway, and Camden Town. The present tramway service between Mile End and Stamford Hill is handicapped in consequence of the parallel omnibus service running through Amhurst Park to Finsbury Park Station.

(6) Southampton Row to New Oxford Street *via* Vernon Place and Hart Street. Length of tramway, about 1 furlong 8 chains of double line. Estimated cost of construction and equipment on the underground conduit system of traction, £30,890. The present terminus at Theobalds Road, which is a dead end terminus for double-deck cars, is very congested at busy hours, and delay is caused to the subway cars which run through to Charing Cross and Westminster. The proposed new tramway would reduce the amount of obstruction, and provide new facilities for passengers desiring to reach the important traffic centre of New Oxford Street.

The total length in single line of the proposed tramways is about 5¼ miles, and the total estimated cost of construction and equipping the tramways is £319,490. The estimates given do not include the cost of the provision of cars, car sheds, sub-stations, and other equipment, and sites for such buildings, as expenditure on these heads is common to more than one route. The existing car sheds and sub-stations will be utilised.



Thick black lines indicate existing tramways, dotted lines proposed extensions and linking-up lines. The subway connection between Theobald's Road and the Victoria Embankment is shown by a thin black line.

Map of proposed London Tramway Extensions.

In only two cases, those of the proposed tramways from Gray's Inn Road to Farringdon Street and from Southampton Row to New Oxford Street, will it be necessary for any widenings to be effected, and the Highways Committee have accordingly communicated with the Improvements Committee with regard to these two proposals, in order that they may submit any necessary recommendations as to such widenings. The estimates above given do not include any portion of the cost of the widenings which may hereafter be allocated to the tramways account.

The proposed new lines in their relation to the present tramway system is shown on the accompanying map. On all the lines with the exception of No. 5 in the list, the line from Seven Sisters Road to Stamford Hill *via* Amhurst Park, the underground conduit system will be used.

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The Finance Committee concurred in the proposal to apply for powers for the proposed lines, and in their report stated that the total cost of the extensions, including the proportion of street widenings chargeable to the tramway account, would be £440,190. While the new expenditure for construction and equipment (£418,215) is very high, owing to the present conditions, each scheme is estimated to show a surplus on working. The report alludes to the difficulty of estimating financial results, for not only are receipts and working expenses abnormally high at present, but it is difficult to estimate exactly the capital cost of the tramways. The figures upon which the estimates have been based are approximately 100 per cent. above pre-war prices. The debt charges will consequently entail a very heavy burden on revenue, and will require a larger margin of revenue over working expenses than under pre-war conditions.

THE LONDON UNDERGROUND RAILWAYS.

AN INTERESTING SITUATION.

More than ordinary interest attaches to the directors' reports and the accounts recently issued for the year 1918 of the railways and the big omnibus undertaking associated with the Underground Electric Railways Company of London. In spite of high prices for everything and of scarcity of labour, the associated companies distribute higher dividends than for a long time past, and most of them have produced more gratifying returns than at any time in their previous history. The two main reasons which have enabled them to hold their own under wartime conditions may be said to be the ever-growing volume of traffic, and in some cases an increase in fares. The results are certainly gratifying and are highly creditable to the management, the engineers, and all the staff, but still the dividends for the railway shareholders are not much to boast about in these days of 5 per cent. Government securities. In considering that feature, however, it has to be borne in mind that the railway capitalisation is necessarily very heavy. The London General Omnibus Company is the member of the group which is not penalised by the cost of constructing tunnels and permanent way, and its dividend is higher. The following is a summary, with explanation and comment, of the records of each of the companies:—

Metropolitan District Railway.

This line may be called the "father" in the group; as a steam railway it goes back to quite a hoary antiquity, but its latest days are proving its best, not its worst. In its steam days it was financially in a lamentable condition, and people only travelled in its sulphur-laden tunnels because they could not help it. Electrification, brought about in 1905, also brought about a revolution in comfort, speed, and finance. A gradual improvement in dividends has gone on, and though the holders of the ordinary stock still receive no return, that stock is less than a third of the total, or, including debenture capital, it is only about a fourth. The total capital is over 13½ millions sterling, and the length of route worked is about 40 miles. This, however, includes a certain length of "foreign" lines worked over and lines partly owned.

The District Railway, unlike the "tube" lines with which it is associated, has been under Government control since the beginning of the war, as it has physical junctions which connect it with the main lines of the country. The accounts are presented in that skeleton form to which we have grown accustomed since the control began. Much information which would be of interest is accordingly not available. Obscurity is increased by the fact that the receipts from working are under not only the terms of the control agreement with the Government, but are also under the terms of the Common Fund agreement of December, 1915, to which further reference is made below. The receipts so arrived at amount for the past year to £1,307,439, compared with £1,122,068 in 1917. The working expenses were £865,427. After bringing in miscellaneous receipts, there is a net income of £583,703, against £568,274, and £565,765 in 1916. After allowing for fixed charges, appropriation to reserve (£35,000), and dividends on guaranteed and first preference stocks, there remains a balance of £104,831. The corresponding balance a year ago was £83,129, and for 1916 it was £74,788. The dividend on the second preference stock is 5 per cent., which is the full rate for the stock, £10,000 more goes to reserve, and £21,331 is carried forward. This is the first time that the second preference stock has received its full dividend. It is not so many years since it received nothing, and when it began to get a little there was a pæan of triumph over this result of electrification of the line. The distribution steadily crept up from 1 per cent. in 1911 to 3 per cent. in 1915, at which it remained till for 1918 the full 5 per cent. has been paid. There is nothing between the second preference stock and the ordinary stock, so that the holders of the latter, if conditions continue to improve, may yet receive a dividend. The reserve fund now stands at £336,528.

The number of passengers during the year is not stated for the District Railway, nor for any of the other undertakings separately, but the aggregate for the five companies is put by way of an estimate at 901,000,000. Reference is made in the various reports to the troubles in working owing to shortage of staff and the difficulty of obtaining materials. A very marked feature on the District Railway has been the enormous amount of military traffic owing to the fact that the railway links up several of the main line termini.

The causes of the overcrowding of the trains which has occasioned much inconvenience to the public are beyond control, as they arise mainly from shortage of rolling stock and insufficient staff. The engineering department, it is no secret, has done wonders with the means at its disposal, and has contrived to maintain a splendid service with an extraordinarily small margin of spare cars in the repair shops. Arrangements are in hand, and now that the war is over there is some prospect of their being carried out, for the provision of additional and improved rolling stock, and employees are now beginning to get back from military service.

It is only on the longer journeys on the District Railway, or on those outside an inner zone, that the 50 per cent. increase of fares applies. In the central regions the fares were low, and during the year they have been revised so as better to meet the heavy charges

The Common Fund.

The Common Fund agreement of the five companies was entered into in 1915 for the purpose of mutual assistance. It does not appear from the accounts that any of the five companies have drawn on the fund for anything but their fixed proportions. The aggregate gross receipts of the companies from all sources were £7,743,451. The amount retained by them for revenue liabilities as defined in the agreement, which include working expenses, prior charges, reserves, and other items of a similar nature, was £7,111,760. The balance of £631,690 was credited to the Common Fund. Under the terms of the agreement the District Company is entitled to 12 per cent. of the fund. It accordingly received £75,803 for the year. This sum, plus £29,028 brought forward, makes a total of £104,831, which is available for dividend on the second preference stock and further reserve. This also is the sum brought out in the accounts which are summarised above. The explanation of the identity of the two sums is, we understand, to be found in the heading in the accounts giving the receipts from working the railway. This runs—"Receipts in respect of railway working under the terms of the agreement with the Government in respect of the control of railways and the terms of the agreement of December 21, 1915, referred to in the report of the directors, £1,307,439." The point lies in the words, "the terms of the agreement of December 21, 1915." This is the Common Fund agreement. The working expenses, fixed charges, and so forth stated in the accounts are absolute sums. The receipts from working the railway, on the other hand, are subject to adjustment, not only under the Government control agreement but under the Common Fund agreement. It is because of the requirements of the latter that the receipts are of such an amount that when all deductions and allowances are made the net balance corresponds to the proportion of the Common Fund to which the railway company are entitled. The same arrangement applies in the case of the affiliated tube railway companies and the London General Omnibus Company.

London Electric Railway.

This company, and the Central London and the City and South London, unlike the District Company, are not under Government control, but the accounts are set out in similar form. This is done, it is stated, to save paper and labour. What is called the London Electric Railway, as is well known, consists of three separate lines, the Baker Street and Waterloo Railway, the Charing Cross, Euston and Hampstead Railway, and the Great Northern, Piccadilly and Brompton Railway. These have an aggregate route length of about 25 miles, almost entirely constructed in twin tubular tunnels at a deep level. The capital issued, including debenture stock, is in round figures 17½ millions, indicating the expensive nature of the construction.

The receipts from working the railway last year were £1,325,628, as compared with £1,139,554 in 1917. The working expenses amounted to £769,677, against £611,892. After bringing in miscellaneous receipts, there is a net income of £650,604, compared with £616,989, and with £500,190 in 1916. A balance forward of £30,656 being added, fixed charges and preference stock dividend being deducted, and £35,000 being appropriated to reserve, there remains £220,163 available for dividend on ordinary shares and further reserve, compared with £180,575, and £164,383 in 1916. The dividend on the ordinary shares is 2 per cent., being the highest on record, a further £10,000 goes to reserve and £23,604 is carried forward. The reserve now stands at £251,000. The highest previous dividend was 1½ per cent., which was paid for 1917 and 1916. For several years it was only 1 per cent., and before that it was less. The company's share of the Common Fund (30 per cent.) is with the balance forward equal to the £220,163 mentioned above.

Despite the difficulties arising out of the war, the traffic carried during 1918 constituted a record for any year since the line was opened. Arrangements have been made to obtain delivery at the earliest possible moment of additional rolling stock, some of which was ordered in 1914. It is proposed to proceed at an early date with improvements which were postponed on the outbreak of hostilities, and additional capital will be required. An arrangement

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has been made between the company and the City and South London and Central London Companies, whereby the London Electric Railway Company bears all the expense of maintaining and operating the three railways, receiving advances of money from time to time as necessary. At the close of each year the expenses are allocated on an agreed statistical basis. By this combined operation considerable economies are being effected.

Central London Railway.

From the point of view of rate of dividends to shareholders the Central London has from the first been the most successful of the "tube" railways. Practically from its earliest days it made a return of 4 per cent. on the ordinary stock. This arose from the fact that it occupies throughout its length one of the greatest lines of passenger movement in London. The development of the motor omnibus, however, affected it considerably, as great numbers of omnibuses run on the street for miles immediately above the railway. Largely on this account the old system of a uniform fare of 2d. for any distance on the railway was superseded by a scheme of fares graded in proportion to distance, so that short-journey traffic might be encouraged. In the days when a passenger could travel from one end of the line to the other—then a distance of less than six miles—the appellation of "the twopenny tube" was appropriate enough. Since then the railway has been somewhat extended both to the east and west, so that it is now about 6½ miles long, and a further extension westward from Shepherd's Bush to Ealing is likely soon to be carried out. The issued capital, including debenture stock, amounts to £4,556,000.

For the past year the revenue from working the railway was £422,183, as compared with £351,289 in 1917. The working expenses were £238,826, against £192,465. Adding miscellaneous receipts, there is a total net income of £227,571, against £196,268. Deducting fixed charges, appropriation to reserve (£20,000), and preference stock dividend, there remains available for dividends on ordinary stocks £137,485, compared with £116,147 and £117,079 in 1916. The dividend is 4 per cent. on the ordinary stocks, and £17,485 is carried forward. The reserve fund stands at £149,141. A year ago, while the preferred ordinary stock got 4 per cent., the allocation to the ordinary was 3½, and to the deferred ordinary 3. The Central London also had a bigger traffic than in any other year of its existence. The Company's share of the Common Fund is 20 per cent.

City and South London Railway.

This, the oldest of the "tubes," also did well during last year. The original section, about three miles long, from the City to Stockwell, was the first railway of the kind ever constructed, and came into operation in 1890. The tunnels are smaller in diameter than those of the other tube railways, and consequently the accommodation in the cars is somewhat cramped. It is the only one of these railways which uses separate electric locomotives to haul the trains, and the latter are consequently light in weight. Years ago an experimental car with the motors underneath it was constructed with the object of finding if it was possible, with such limited space available, to use the multiple-unit train system employed on the other lines, but if possible it has not been adopted in practice. In such small tunnels there are advantages in having separate locomotives, and the latter are not of sufficient weight to cause the vibration which led to the abandonment of separate locomotives on the Central London Railway some years ago.

Including the extensions made from time to time, the railway is 7¼ miles long, but it has not such a large traffic in proportion to length as some of the other tubes. On the other hand, its capitalisation per mile is somewhat less, the tunnels and many of the stations being smaller. The capital issued, including debenture stock, is £3,424,000.

For the past year the revenue from working was £309,315, as compared with £258,233 in 1917. The working expenses were £180,812, against £141,185. Adding miscellaneous receipts, there is a total net revenue of £152,405, against £142,323. Deducting fixed charges, preference stocks dividends, and appropriation to reserve (£25,000), there remains available for dividend on the ordinary stock £59,167, against £48,466 for the preceding year, and £39,445 in 1916. The dividend on the ordinary stock is 2 per cent., £5,000 more goes to reserve, and £24,567 is carried forward. The ordinary stock dividend for 1917 was 1½ per cent., and round about that figure or less it has hovered for a long time. The reserve now stands at £91,000. The City and South London's share of the Common Fund is only 6 per cent., and this with £21,266 brought forward amounts to the £59,167 already mentioned.

As in the case of the other tube railways, the traffic for the year was the greatest on record. Arrangements are in hand for the purchase of new and larger cars, and the work of enlarging the tunnels, which was suspended on the outbreak of the war, will shortly be recommenced. For the purpose additional capital will be required.

London General Omnibus Company.

Having dealt with the various railways, we come to that interesting and remarkable partner of a railway company, the London General Omnibus Company. As is well known, it owns the great bulk of the omnibuses which run in London and the surrounding districts. Unlike the railways, it had no need to spend any capital in constructing its road, and it has practically nothing to pay towards maintaining it. It is accordingly not surprising to find that a good dividend is paid. Were it not for the fact that the percentage of expenses to receipts in working petrol omnibuses is very high compared with the corresponding percentage in the case of an electric railway, a motor omnibus company would be able to pay very large dividends. The London General Company suffered very severely during the war, as not only had it the same troubles as the railways in consequence of scarcity and the high cost of labour and materials, but many of its vehicles were taken away for war service on the Continent. Hence both lower revenue and an intolerable overcrowding of the omnibuses. For a long time thay have not been able during the rush hours to carry anything like the traffic offering.

The issued capital, including debenture stock, is £3,524,000. The gross receipts for last year came to £3,979,799, against £3,401,708 for 1917, and the working expenses were £3,456,244, compared with £2,988,209. An allowance of £22,629 is made for depreciation, and £285,000 is carried to reserve, which now stands at no less than £1,904,869. After crediting interest on investments and debiting fixed charges, a net balance is left of £240,688, against £187,926. The company receives no less than 32 per cent. of the Common Fund, and that amount, along with a balance forward of £38,547, comes to the £240,688 mentioned above. A dividend of 8 per cent. is paid, and £60,930 remains which is carried forward. A year ago the dividend was 7 per cent.

The dividend is equal to that which used to be paid in the old horse omnibus days, before all the expense and work of developing the motor vehicle began. It may be remembered that in the earlier years of the latter the company was in a comparatively non-prosperous condition. It will also be observed that even after appropriating a very large sum for depreciation and reserve, the company's large share of the Common Fund enables it to pay a handsome dividend.

In the ordinary way the working "life" of a motor omnibus is not very long, so that a good reserve and depreciation allowance are necessary. Then during the war maintenance could not be fully carried out. The wisdom of accumulating a large depreciation and reserve fund is obvious. The need for the fund is emphasised by the statement of the directors in their report that the fleet of omnibuses has now reached such a state as to require complete renewal.

At the annual meetings of the companies held during February no definite forecast as to the future was made by the chairmen. Conditions as to labour and cost of materials are too uncertain. Some of the chairmen mentioned that further increases of fares will be necessary, and this is not surprising as regards lines which have not participated in the 50 per cent. increase applied to the railways of the country generally. Lord Farrer, who presided at the meeting of the London Electric Railway Company, stated that, as the price of material and labour was so high, only vitally important works could be undertaken with any hope of securing an adequate return on the capital expenditure. As regards the omnibus company, a considerable number of additional vehicles were put on the streets in the end of February; this course was rendered possible by the return of drivers from the army.

The Lots Road Power Station.

Mr. Z. E. Knapp, manager for maintenance and construction of the underground railways, issued a statement in February in connection with the subject of overcrowding, in which he recapitulated the well-known causes. The most interesting part, however, was the information he conveyed in regard to the Chelsea power station from which the railways are worked. He said that compared with the end of 1914 the load on this station shows an increase of 17 to 18 per cent. The greatest difficulty is in regard to the coal supply, and this difficulty has been increasing since 1915, when it was first necessary to burn a percentage of inferior coal mixed with the usual supply. This inferior coal is poor in steam-raising qualities and contains an abnormal amount of ash and clinker. One result of having to handle and burn a type of coal for which the plant was not designed is to accentuate the labour difficulty. More labour is required to handle the coal; the number of boilers must be increased and the number of attendants also; an extra strain is put on the stoking and ash-handling plants, involving increased maintenance. Moreover, the general restrictions on coal consumption are being severely felt at Lots Road power house. Just before the war a 15,000 kw. turbine was obtained; and this was put into commission in 1915. The results were so good and the saving in coal so large that arrangements were put in hand to instal a second one of the same size. Incidentally this would have saved some thousands of tons of coal, but a permit could not be obtained, and the project had to be abandoned. The permit has now been received and contracts placed for the second set.

Underground Railways Company.

The report of the Underground Electric Railways Company of London also makes a comparatively good showing. This company, it will be remembered, carried out the electrical equipment of the District Railway, constructed and equipped the tube lines now owned by the London Electric Railway Company, and built the Chelsea power-station, taking payment to a large extent in shares

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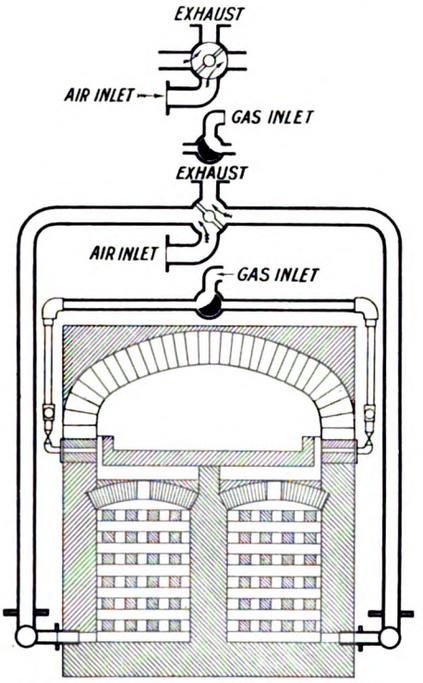
or stock of the associated undertakings. After the initial work was finished, the railways took over the operation of the power-station, and the Underground Electric Railways Company became simply a holding company, receiving its revenue in the shape of dividends on the stocks and shares held. The issued capital is, in round figures, 15 millions, of which one-third is in shares and the rest in bonds and debentures. This is balanced by the holding of stocks and shares in the other companies valued at over 14½ millions. A certain amount of shares in the London and Suburban Traction Company, the Associated Equipment Company, and other undertakings is included. The income from the investments for the past year was £760,265, as compared with £606,730 for 1917. After meeting prior charges, interest at 5 per cent. is paid on the 6 per cent. 1948 income bonds, and £36,693 remains, which is carried forward. A year ago the interest paid on these bonds was 4 per cent. The ordinary shares are not within sight of a dividend.

THE DAVIES "REVERGEN" GAS-FIRED FURNACE.

The possibilities of fuel saving in the use of town's gas-fired furnaces was clearly demonstrated to a number of Press representatives on the 18th, 19th, and 20th of February by the Davis Furnace Company, at their works at Luton. Some remarkable results were achieved, and in view of the high cost of labour with which manufacturers will be faced in the future, not the least interesting feature of the "Revergen" system of furnace heating is the little attention required in its working. Briefly stated, the "Revergen" furnace is so constructed that the heat losses by way of the flues are reduced to a minimum, the thermal energy thus recovered being utilised almost exclusively for the practical purposes of the furnace. It follows, therefore, that a much larger proportion of the total heat latent in the gas consumed in firing is utilised in the generation of the desired working temperature by furnaces fired upon this principle



Davis "Revergen" Gas-Fired Oven.
(54 in. × 32 in. × 24 in.).

than in the case of any of the older systems. Apart from the possibility of maintaining a given temperature with a greatly reduced gas consumption, much higher temperatures are rendered economically attainable, while the precise accuracy of temperature control was demonstrated by the actual working tests which were witnessed by the visitors. The wide temperature range, fuel economy, and uniform heating ensured by the Davis "Revergen" furnaces renders them especially serviceable for the various heat treatment operations, case hardening, annealing, billet heating, etc. Amongst operations to which this furnace can also be applied on a successfully commercial basis is the heat treatment of refractory materials for which extremely high temperatures are required.

The demonstrations were arranged to give the actual working results in the three general uses for which the furnace is designed, viz., that on the 18th "annealing," on the 19th "billet heating," and on the 20th "firing refractories." Each of these tests was carried out in the presence of the visitors, and all the figures, including the reading of the gas meter both before and after each operation, were checked by the visitors.

The following are the details of the results obtained in the operation of billet heating to a temperature of 1000 deg C. It will be noted that three separate charges were made, the oven being raised to the required temperature in the first place. The extra time and gas consumed on the second and third charges was in consequence of the heat losses during the drawing and recharging operations :—

OPERATION.—Billet heating to 1000 deg. C.

FIRST CHARGE.—20 billets. 985 lb.
Time in.—11.9 a.m. *Meter.*—4,067,700.
Time out —12.24. *Meter.*—4,069,100.
TIME TAKEN.—1.15. *Gas used.*—1,400 c. ft.
Gas per lb. 1·421 c. ft. } Efficiency.
Gas per ton 3,183 c. ft. }
Drawn at 1025 deg. C. Thermo-couple pyrometer.
,, 1025 deg. C. Fery pyrometer.

SECOND CHARGE.—20 billets. 980 lb.
Time in.—12.35 p.m. *Meter.*—4,069,100.
Time out.—1.55. *Meter.*—4,070,675.
TIME TAKEN.—1.20 hours. *Gas used.*—1,575 c. ft.
Gas per lb. 1·60 c. ft. } Efficiency.
Gas per ton 3,599 c. ft. }
Drawn at 1020 deg. C. Thermo-couple pyrometer.
,, 1020 deg. C. Fery pyrometer.

THIRD CHARGE.—20 billets. 987 lb.
Time in.—2.5 p.m. *Meter.*—4,070,675.
Time out.—3.25. *Meter.*—4,072,250.
TIME TAKEN.—1.20 hours. *Gas used.*—1,575 c. ft.
Gas per lb. 1·59 c. ft. } Efficiency.
Gas per ton 3,561 c. ft. }
Drawn at 1020 deg. C. Thermo-couple pyrometer.
,, 1020 deg. C. Fery pyrometer.

NOTE.—The average exhaust gas temperature was 180 deg. F. At no time did the thermometers record a temperature in excess of 200 deg. F. The average calorific value of the gas used throughout the day was 463 B.T.U.'s per c. ft.

In the annealing test 20 billets of a total weight of 987 lb. were used. These were raised from cold to a temperature of 820 deg. C. in 1–15 hours, with a total gas consumption of 1,350 c. ft. = 1·37 c. ft. per lb. of steel. The gas used to maintain the temperature was for first hour 300 c. ft., second hour 200 c. ft., and for third hour 325 c. ft., making an average for the three hours of 292 c. ft. = ·294 c. ft. per lb per hour.

In the high temperature test on refractory materials the total time taken was 5½ hours and the gas consumed was 7,850 c. ft. The final temperature obtained was 1690 deg. C. For the first hour and a half of the run the furnace was maintained at a steady temperature of 1490 deg. C., the gas consumed being 1,350 c. ft. During the last hour of the run at the maximum temperature the gas consumption was at the rate of 1,450 c. ft. The average calorific value of the gas used during the day was 451 B.T.U.

TRADE PUBLICATIONS.

ELECTRICAL ARC WELDING.

The Equipment and Engineering Company, of 2 and 3, Norfolk Street, London, W.C., have issued four leaflets on electrical arc welding plant. One of these leaflets is illustrated in colour, and is intended to show tramway engineers and others interested that the process is so simple that it can be carried out by ordinary labour, while repairs can be effected at small cost, that the saving of scrap parts is considerable, and that the plant can be considered as a paying investment. The illustrations show gear cases, brake hanger links, lever fulcrums, tramway pinions, and crossings which have been welded.

PATENT STAIR TREADS.

Messrs. Hughes, Bolckow and Company, Limited, of Blyth, Northumberland, have issued a circular describing the Andrews-Hawksley patent stair treads. These treads can be fitted to iron staircases with cast-iron bed risers, or plate risers, or, if necessary, they can be made with end lugs for bolting to stringers. The Number 2 type, with wrought-iron frames fitted with hardwood blocks, are four times reversible. The blocks are old seasoned ship oak or battleship teak wood. They provide a non-slipping, silent, unbreakable, and fireproof tread. They have been largely used by the Admiralty, the War Office, and railway companies.

COAL AND ASH PLANT.

A new catalogue on "Coal and Ash Plant," issued by Ed. Bennis and Company, Limited, Little Hulton, Bolton, and 28, Victoria Street, London, S.W.1, consists of 64 pages of text fully illustrated and covers a wide range of application. Owners and managers who want to increase output, reduce costs, eliminate waste, and attain the maximum of efficiency in their handling and burning of fuel, will find catalogue suggestive and helpful.

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NEW AND PROSPECTIVE WORK.

Bolton Tramways Committee propose to re-lay the track on the Daubhill route, and have approved of the purchase of the rails, points, and crossings required.

Nottingham Electricity Committee's recommendations for the installation of new working plant at an estimated cost of £55,000 has been accepted by the Council.

Stirling Council have decided to obtain expert advice with regard to the present position of the tramway undertaking with a view to its purchase and subsequent electrification.

Bexley Council requires £13,000 for the reconstruction of the tramway track, and has asked the War Office, the Ministry of Munitions, and the Road Board for financial assistance.

Plymouth Corporation propose to spend £210,000 on tramway extensions and renewals, including a new line to the Laira district and further lines to connect the tramways of Plymouth and Devonport.

Halifax Corporation have informed Stainland Urban Council that they will extend the tramways to Stainland as quickly as possible, but owing to the shortage of labour and the high cost of material a definite date cannot be given.

Bradford Tramways Committee propose to order twenty-six new cars and fifty-two traction motors. The chairman and deputy chairman have been empowered to place orders forthwith, and to press for delivery at the earliest possible date.

Of the Rotherham permanent way five miles of single track requires immediate attention and doubling at a cost of £50,000, and a new five-mile single track is required at a cost of £60,000. It is also desired to expand the tramways to Wickersley.

Ilford Council are making application to the Local Government Board for sanction to a loan of £25,000, the expenditure required for the purchase of new plant, etc., for the electricity undertaking, which has been recommended by Mr. A. H. Shaw, the electrical engineer.

Huddersfield Corporation are promoting a Bill for the construction of a tramway to bring their system to the centre of Brighouse. Brighouse Corporation have pressed for the construction of the line, and Huddersfield Tramways Committee have agreed to carry out the scheme as soon as practicable.

Liverpool Tramway and Electric Power Committee propose that application be made to the Local Government Board for sanction to borrow £200,000 for generating plant, £190,000 for electric mains, £70,000 for new cars, £65,000 for motor omnibuses, £15,000 for motor garage and equipment, and £10,000 for a new car shed; total, £550,000.

Oldham Town Council have promoted a Bill to authorise the construction of a tramway along Oxford Street to Butler Green to link up tramways which Chadderton Urban Council propose to seek powers to run from Chadderton, *via* Gorse Mill, to Butler Green. It is estimated that the work could be carried out in three months, but provision would be made for it to be completed within five years.

West Hartlepool Council have authorised the Tramway Committee to purchase six new cars, three pairs of maximum traction trucks complete with electrical equipments, and nine sets of electrical equipments, at a total estimated cost of £24,187. The £15,375 required for the cars is to be borrowed if the Board of Trade permit. The passengers carried have increased from 3½ millions in 1914 to over 8 millions per annum.

Leeds Sub-Tramways (Works Management) Committee, after considering proposals for an estimated expenditure on tramway permanent way of £70,000, have approved the plans and have directed the general manager to obtain tenders for material and labour for works in Boar Lane, Meadow Lane, and Park Lane. Work on the reconstruction and renewal of highways in Boar Lane, Park Square, and other streets is also to be undertaken at an estimated cost of £5,926.

Sorbitic Treatment of Rails at Bournemouth.—Mr. I. Bulfin, general manager of Bournemouth Corporation Tramways, has received a quotation from Scholey and Company, Limited, for the application of the sorbitic treatment of rails at the price of £1 per yard of single track. The manager has reported to the committee that this treatment is estimated to increase the life of the permanent way by 50 per cent., and he proposes to experiment on a mile of single track at a cost of £1,760. The committee approved the plan, and the work will be commenced without delay.

FINANCIAL REPORTS AND MEETINGS.

Scarborough South Cliff Tramway Company.—At the annual meeting of this company on January 29, a dividend of 6 per cent. was declared and £113 was carried forward.

City of Buenos Ayres Tramways.—A balance dividend is declared of 1s. 3d. per share, making 5 per cent. per annum, less income tax, for the year ended December 31 last.

Metropolitan Railway Company.—A dividend has been declared on the ordinary stock at the rate of 1½ per cent. per annum for the past half-year, making 1¼ per cent. for the year, after placing £20,000 to general renewals fund and carrying forward £19,000.

London United Tramways Company.—Resolutions have been adopted approving the reduction of the company's capital from £2,500,000 to £656,250, divided into £125,000 preference shares of £5 5s. each, to be sub-divided into 21 fully paid shares of 5s. each, such shares to be converted into ordinary shares of 5s. each.

Dover Tramway Estimates.—The estimates submitted to the Dover Tramways Committee show a probable deficit for the year ending March, 1920, of nearly £10,000, due principally to the heavy cost of track repairs. Powers for a loan are to be sought for the purchase of several new cars.

Castlederg and Victoria Bridge Tramway.—The working for the past year, after providing for interest, shows a balance of £750, which the directors recommend should be carried forward. The board regret to record the death of their chairman, Dr. T. Leary, one of the promoters of the line. The vacancy has been filled by the appointment of Major G. F. V. Leary.

Carlisle Tramways Company.—The report for 1918 states that after providing for debenture interest and appropriating £1,500 for redemption of second debentures, there is a balance at the credit of profit and loss account amounting to £221, which the board recommend should be carried forward. The improvement of just over £2,000 in the receipts was offset by largely increased expenditure.

Falkirk and District Tramways.—In moving the adoption of the report for the year ended October 16, 1918, at the annual meeting on February 20, Mr. G. Balfour, M.P., stated that the traffic receipts showed an increase of £6,800, or about 30 per cent. Expenses of operating had considerably increased, largely owing to wages increases due to Government awards. A dividend of 7 per cent. per annum, less tax, was declared on the share capital, and £1,322 was carried forward.

Tramways, Light and Power Company.—The report for the year ended December 31, 1918, shows a profit of £42,321, which, added to £5,277 brought forward, gives £47,599. Deducting loan and debenture interest, less tax, £12,396, debenture redemption account £3,183, and interim dividend on preference shares to June 30, 1918, less tax, £7,107, there is left £24,913. The directors propose a final dividend on preference shares to December 31, less tax, to transfer to reserve fund £12,000, and to carry forward £5,806.

Liverpool Overhead Railway Company.—A dividend has been declared at the rate of 5 per cent. per annum on the preference shares and 4 per cent. per annum, making 3¼ per cent. for the year, on the ordinary shares, leaving a balance of £6,119 to be carried forward. The gross receipts under the terms of agreement with the Government amounted to £143,361, and the working expenses, including appropriation to reserve funds, to £113,234, leaving £30,127. Deducting debenture interest (£6,755) and including the balance brought forward (£6,928), there is a balance available for dividend of £30,300.

Llandudno and Colwyn Bay Electric Railway.—The report for the year ended November 30 shows that the total receipts amounted to £23,271, and expenditure, including interest on debentures and loans, to £15,333, leaving a balance of £7,938. Including £197 brought forward, there is an available balance of £8,135. Of this amount, sinking fund instalment requires £1,775, and £1,500 has been transferred to reserve for renewals. A dividend at the rate of 4½ per cent. per annum has been declared, leaving £387 to be carried forward. No construction work has been done during the year, but it is hoped to effect certain improvements at an early day.

Isle of Thanet Electric Tramways.—Since the Armistice was signed there has been a considerable improvement in the receipts of the Isle of Thanet Electric Tramways and Lighting Company. It was mentioned at the annual meeting that the receipts of the tramways for the past year showed an increase of £258. The receipts for the lighting department fell off by £1,196, owing to the restrictions on lighting and the necessity for reducing coal consumption. The accounts for the year ended September 30, 1918, showed a loss of £4,817, and deducting the credit balance of £3,825 brought forward, there is a debit balance of £992 to be carried forward. In the previous year the loss was £4,731.

Leicester Corporation Tramways.—The report for 1918 shows traffic revenue £237,821 (1917, £191,636); other revenue £57,094 (1917, £52,012); total £294,916 (£243,648). Working expenses £218,506 (1917, £172,583); balance £76,409 (1917, £71,065). The car miles totalled 3,726,462, and passengers 50,983,223. The percentage

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of working expenses to receipts was 70 per cent.; the average traffic revenue per mile was 15·317d.; average expenses, including power cost, 14·072d. per mile. The sinking fund stands at £255,443, and the amount of reserve or renewals fund is £83,868, on a gross capital expenditure of £933,912. The working expenses, £218,506, were £45,923 over 1917, due to increased charge for power, war bonus to employees, and higher price of materials.

THE ENGLISH ELECTRIC COMPANY, LIMITED, went to allotment in the middle of February. It will be remembered that this company having arranged to acquire the entire holding of preference and ordinary shares in the Coventry Ordnance Works, Limited, and the Phœnix Dynamo Manufacturing Company, Limited, made an offer to the shareholders of Dick, Kerr and Company, Limited, to exchange shares on certain terms. It is now announced that about 90 per cent. of the Dick-Kerr shareholders have accepted the offer. The English Electric Company, Limited, will control directly or through Dick, Kerr and Company, Limited, the following powerful group of manufacturing interests, viz.:—The Coventry Ordnance Works, Limited, Dick, Kerr and Company, Limited, the United Electric Car Company, Limited, and Willans and Robinson, Limited. The company is registered with a capital of £5,000,000 in 1,500,000 £1 preference and 3,500,000 in £1 ordinary shares, and the issued capital on allotment is just under £2,000,000.

LEEDS TRAMWAY ESTIMATES.—The estimates for the current year indicate that the revenue in traffic receipts will amount to £716,440. Including sundries, estimated at £8,530, there is a total of £724,970, an increase of £138,339 as compared with last year, or 26 per cent. The increase in income is attributed mainly to the increase in fares which took place in June last. The estimated number of passengers for the current year is 113,129,800, or a decrease of 9 per cent. It is expected that in the following year it will be possible to run more cars in order to cope with the increased traffic, and an additional income is anticipated of £77,670, making an aggregate of £802,640. The surplus profit applied to the relief of the rates last year was £38,000. The increased income does not, of course, indicate a prospective increase in profits owing to the great advance in war bonuses and the cost of material. The wages bill for the current year is approximately £258,000, or £60,500 more than last year, but the full effect of the advance has not yet been felt, as the whole of the increase was not paid throughout the year.

FIFE TRAMWAYS, LIGHT, AND POWER COMPANY.—The annual meeting was held on February 19. Mr. W. Low, chairman, proposed the adoption of the report and accounts. The gross revenue was £43,323 against £33,677, and the available profits £38,652 against £30,578. The amount carried forward is £5,095 against £8,390. The tramway from Dunfermline to Rosyth Naval Dockyard was opened on May 17, and had proved an exceedingly satisfactory addition. The cars ran 807,195 miles, compared with 600,000 miles in 1917, and carried 8,000,000 passengers, compared with 4,905,106. Of the total passengers, 2,500,000 were carried on the Rosyth section, and these passengers were divided into naval ratings, 50 per cent.; workmen, 20 per cent.; ordinary traffic, 30 per cent. The total traffic receipts amounted to £70,700, as against £38,807 during the preceding year, or approximately 82 per cent. increase. This is largely due to the Rosyth line, and compares with a total increase in passengers carried of 63 per cent. The tramways paid over as dividend and management fees £25,250, as against £17,050. The power company continued to make very substantial progress. The revenue paid over by the power and lighting undertakings as fees and dividends amounted to £18,045, as against £16,615.

YORKSHIRE AND DISTRICT TRAMWAY MANAGERS' ASSOCIATION.—A meeting of the Yorkshire and District Tramway Managers' Association was held at the Leeds Tramway offices on February 11. The following members were present:—Messrs. J. B. Hamilton (Leeds), H. Webber (Keighley), S. Clegg (Lincoln), W. A. Toppin (Chesterfield), A. A. Blackburn (Huddersfield), H. Cordukes (Scarborough), H. Jagger (Rotherham), H. L. White (Grimsby), R. H. Wilkinson (Bradford), W. E. Nicoll (Barnsley), A. Daggett (Leeds), J. W. Galloway (Halifax), W. McGibbon (Mexboro' and Swinton), H. England (Wakefield). Mr. J. B. Hamilton took the chair and extended a hearty welcome to Mr. Toppin, who has succeeded Mr. Acland in Chesterfield, and also to Mr. Blackburn, who has been appointed general manager of the Bradford tramways. An interesting discussion took place respecting the demand for a shorter working week, increased car services, liability of tramways respecting parcels traffic, etc. It was decided to hold meetings quarterly in future, but the honorary secretary was authorised to summons a meeting whenever he thought it advisable.

ACCOUNTS OF THE UNDERGROUND GROUP.—The report of the Underground Electric Railways Company for 1918 includes a new statement summarising the results of the associated companies. After providing for expenses the company's income from investment was £760,264 against £606,730 for 1917, and after payment of 5 per cent. for the year on the 6 per cent. income bonds, against 4 per cent. for 1917, there remains £36,693 to be carried forward. The income from the London General Omnibus was £179,758, as against £112,033 for 1917. Associated Equipment produced £205,468, compared with £126,000; the London Electric Railway £232,543, against £140,337; the District £76,650, or £41,213 more; and City and South London £45,687, compared with £28,381. Last year's income of the Underground Company was equivalent to 5 per cent. on the total capital. The Associated Equipment Company took over the manufacturing department of the Omnibus Company and is the most profitable constituent of the group. It pays 14 per cent. on a million capital, and is a bigger source of profit to the Underground than is the Omnibus Company itself. During the year it has been almost wholly occupied in making 3-ton lorries for the Government, but is now at work replacing the company's omnibuses and manufacturing for general sale.

TYNESIDE TRAMWAYS AND TRAMROADS COMPANY.—For the year 1918 the surplus of receipts over expenses is £9,297 18s., which, with the balance brought forward from last half-year of £1,696 16s., makes a total to the credit of profit and loss account of £10,994 14s. After deducting interest on debentures, loans, etc., amounting to £1,012 13s., there is an available balance of £9,982. This profit the directors propose to appropriate as follows:—Dividend on preference shares at the rate of 5 per cent. per annum (less income tax), £601; in the payment of a dividend on ordinary shares at the rate of 5 per cent. per annum, making, with the dividend paid in September last, 5 per cent. for the whole year, being the same as for the year 1917, £3,347 10s.; payment to ordinary shareholders of a bonus at the rate of 2s. per share, £1,339; for renewals, depreciation, etc. (which, with £909 interest on investments, will increase that fund to £33,566), £1,400; special reserve account, to meet contingencies, £1,000; carrying forward to next half-year £2,294. The traffic receipts show an increase of £3,373 17s., as compared with the corresponding half-year of 1917, and for the whole year there is an increase of £9,527 11s. The car miles totalled 647,980, as against 646,846 in 1916 and 724,697 in 1914. Other items for the same three years were:—Passengers (Tyneside Company's lines), 10,276,770, 7,261,986, and 6,749,161; total traffic receipts, £52,581, £31,463, and £31,819; gross profit, £18,246, £10,352 and £12,009.

THE LANCASHIRE UNITED TRAMWAYS, LIMITED.—The ordinary general meeting of the above company was held at Winchester House, London, E.C., on February 25. The Hon. Sir Arthur Stanley, G.B.E., chairman, in submitting the report and balance sheet to December 31 last, stated that the receipts of the combined undertaking for the year showed an increase of £40,827, and that the expenses had also increased by £25,925. After paying the interest on the company's prior lien and second mortgage debenture stocks, the balance remaining had been placed to renewals or carried forward. The lease of lines held by the New St. Helens and District Tramways Company, Limited, of which this company holds about 80 per cent of the capital, expires on September 30 next, the St. Helens Corporation having definitely decided to run the lines themselves. The company has decided to resume the motor coach traffic which was interrupted on the outbreak of war, as from the experience gained during the summer of 1914, there is undoubtedly a great demand for this traffic. The chairman expressed the sincere sympathy of the board with the dependants of those employees who have been killed in the war. He also read a letter from Sir Ernest Clarke, director of the Motor Ambulance Department of the British Red Cross Society, conveying the grateful thanks of his department to the staff and employees of the company for the generous contributions which they have made to the Red Cross funds during the period of the war.—The report to December 31 last gives the result of the working of the combined undertaking as follows:—Traffic receipts, £160,867; electrical energy sold and miscellaneous receipts, £21,174—total, £182,041; less working expenses, £91,442; cost of generating electrical energy sold, £14,586; general charges (including direction, management, etc.), £6,647; rent of leased lines, £5,191; leaving £64,375. Adding dividend on holding in the New St. Helens and District Tramways Company, £3,068, the profit of combined undertaking is £67,443. Receipts show an increase of £40,827, the traffic earnings per car mile amounting to 17·85d. The increase in expenditure amounted to £25,925. The directors have decided to develop the motor transport business in conjunction with the tramways system, and have placed orders for 25 motor coaches. The lease of the lines held by the New St. Helens and District Tramways Company from St. Helens Corporation expires on September 30 next. Negotiations have been carried on with the Corporation for the renewal of the lease, but without result. The company holds about 80 per cent. of the issued capital of the New St. Helens and District Tramways Company. It is not anticipated that the revenue of the company will be materially affected by the change. The interest and dividends received from the operating companies, together with sundry receipts, amounted to £19,973. After deducting interest on the prior lien debenture stock and expenses, there remains a balance out of which the full interest of 5 per cent., less tax, will be paid on the second mortgage debenture stock for 1918. The balance on the year's working of the operating companies, after payment of the interest and dividends, is £40,111. The depreciation and renewal accounts and amounts carried forward amount to £112,962.

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PERSONAL.

Mr. Thomas Clarkson has been elected president of the Institution of Automobile Engineers for the ensuing year.

Mr. W. J. McCombe, manager of Hull Corporation Tramways, has been granted an increase in salary of £200 to £800.

Alderman R. T. Fletcher has resigned the chairmanship of the Wigan Tramways Committee on the ground of ill health.

Mr. J. H. Thompson, of Carlisle, has been appointed electrical engineer to Colne Corporation, at a salary of £350 per annum.

Mr. J. A. Crowther, electrical engineer of Wallasey, has been granted an increase in salary to £800, by four yearly instalments of £50.

Mr. W. McClelland, O.B.E., has been appointed by the Admiralty director of electrical engineering, succeeding Mr. C. H. Wordingham, C.B.E.

Mr. G. W. Holford, general manager of Salford Corporation Tramways, has been granted an increase in salary from £700 to £750 a year.

Mr. E. Sedgwick, of Rochdale, has been appointed depot superintendent of Southport Corporation Tramways at a salary of £250 a year.

Mr. T. Owen, traffic superintendent of the East Ham tramways department, has been granted an increase in salary to £250 per annum.

Mr. R. R. Greene, tramways manager of Wallasey Corporation, has been granted an increase in salary to £700 by two instalments of £50 per annum.

Wolverhampton Corporation has fixed the salary of **Mr. C. Owen Silvers**, general manager and engineer of the tramways department, at £600 per annum.

Mr. A. Letts, electricity station superintendent of Lincoln, has been granted an increase in salary to £300 per annum, rising by two annual increments to £350.

Mr. W. L. Larkin read an interesting paper on "Electric Welding and Its Applications" at the Royal Society of Arts on March 12. Sir R. A. Hadfield presided.

Mr. H. E. Stilgoe, city engineer and surveyor of Birmingham, is nominated as president of the Institution of Municipal and County Engineers for the year 1919-20.

Sir Eric Geddes, in view of his duties as Minister of Ways and Communications, has resigned his appointment as deputy general manager of the North Eastern Railway.

Mr. C. C. Hawtayne has been appointed consulting engineer by Maidstone Town Council for the proposed extension of the tramways, in succession to the late Mr. Stephen Sellon.

Lieut. Ernest Leighton, of the Air Force, who joined the Army in 1914, has now resumed his position as manager of the installation department of Messrs. C. A. Vandervell and Company.

Major H. Clifford Palmer, manager of the publicity department of the General Electric Company, has resumed duty after an absence on service during the whole period of the war.

Mr. H. C. Lester, who had been with Dennis Brothers, Limited, of Guildford, for 15 years, has now accepted a position with Wells and Mayner, Limited, automobile engineers, of Birmingham.

Mr. J. J. McGregor has been appointed charge shift engineer and boiler house superintendent at Greenwich power station of the London County Council at a salary of £300, rising to £400 per annum.

Lieut. V. H. M. McMahon, R.A.S.C., M.T., of Cheetham, Manchester, was married to Miss Alice Winifred Hodson, of Octagon House, Fairfield, Manchester, on February 19, at St. Ann's Church, Fairfield.

Mr. C. F. Spencer, chairman of Halifax Corporation Tramways, has resigned the position of director-general of the National Kitchens Division of the Ministry of Food, owing to the demands of his business engagements.

Messrs. Coote and Harris have been appointed by Bexley Council to represent them on the Metropolitan Municipal Traffic Council, which has been formed to take the place of the Metropolitan Association of Tramway Managers.

Sir Sam Fay, general manager of the Great Central Railway, relinquishes his appointment as Director-General of Movements in Railways, at the end of this week. Sir Sam Fay succeeded Sir Guy Granet in this appointment a few months ago.

Mr. F. M. Foster, assistant engineer and manager of Norwich Electric Tramways Company, has been appointed engineer and acting manager in succession to Mr. F. W. Ketley, who recently resigned the management of the above company.

Mr. J. B. MacKinnon, traffic superintendent of the London United Tramways, was, on the resignation of Mr. W. E. Hammond, appointed general traffic superintendent of the Metropolitan, the London United and the South Metropolitan Tramways.

Mr. J. B. Hamilton, commercial manager, Leeds Corporation, has been elected as one of the seven representatives of the Council of the Association of Municipal Corporations on the National Joint Industrial Council for Local Authorities Non-trading Services.

Mr. T. W. Bloxam, chief electrical engineer to Belfast Corporation, has been granted an increase in salary from £800 to £1,000. In 1914 his yearly increase of £50 was arrested owing to the war, and the present increase is the amount he would have received by this time.

Mr. S. L. Pearce, chief engineer and manager of Manchester Corporation electricity department, has been granted an increase in salary from £1,500 to £2,000 per annum. **Mr. W. E. Foden,** financial superintendent, has been granted an increase from £500 to £600 per annum.

Mr. P. F. Sullivan, at a meeting of the Institution of Civil Engineers of Ireland, on March 3, read a paper on "Tramway Curves and Special Work." The paper was accompanied with plates of various forms of curves, which were dealt with from a geometrical and mathematical point of view.

Lieut. Peter D. Fisher, R.F.A., youngest son of Mr. Peter Fisher, general manager of Dundee Corporation Tramways, has been awarded the Croix de Guerre. Lieut. Fisher, who is 22 years of age, enlisted in the A.S.C. in the first month of the war, but shortly afterwards was transferred to the R.F.A., in which he received a commission. He was wounded in June, 1916, but remained at his post.

Management of Wigan Tramways.—From the applicants for the position of general manager of Wigan Corporation Tramways, the following short list was selected:—Lieut. L. Bellamy, R.E. (Ilkeston), Messrs. William Billington (Salford), H. Clayton (Preston), W. H. Ellis (Chester), Benj. Hall (Keighley), and A. B. Slater (Burton-on-Trent). Subsequently Mr. William Billington was appointed to the position at a salary of £500 per annum.

Sir Arthur Stanley was on February 11 presented with his portrait, a silver salver, and an album containing the names of 630 subscribers on the headquarters committee and staff of the Red Cross and the Order of St. John, in recognition of his work as chairman of the Joint War Committee of those bodies. In reply Sir Arthur said he should give the salver to St. Thomas's Hospital. He intended to convene a Red Cross Convention at Geneva, with the object of promoting public health and infant welfare during the period of reconstruction.

L.C.C. Boiler House Superintendent.—In connection with the reorganisation of the electrical branch of the London County Council Tramways Department, the details of which were approved by the Council on December 8, 1917, authority was given for the appointment of one additional charge shift engineer at Greenwich power station. Mr. J. J. McGregor was then appointed boiler house operating charge engineer, and the Highways Committee stated on February 18 that he has carried out his duties in a most satisfactory manner. They now proposed that the arrangement should be somewhat modified, and that a new appointment as boiler house superintendent should be provided, the salary being fixed at £300, rising by annual increments of £20 to £400 a year, and that Mr. McGregor should be appointed to that position. Under this arrangement the number of charge shift engineers would be reduced by one and Mr. McGregor would be in entire charge of the boiler house under the power station engineer and the assistant power station engineer. It was recommended that he shall continue to receive the special temporary allowance of £50 a year, in addition to the war bonus applicable to the technical staff.

Mr. J. A. Kenny, who for eight years was engineer with the Paisley and District Tramways Company, and who has left the service of the company to enter into partnership in a business in Dublin, was presented with valuable gifts from the directors and the employees. The members of the running staff gave him a gold watch, suitably inscribed; headquarters gave him a gold chain in keeping with it, and the directors a costly case of engineers' measuring and drawing instruments, along with a case of silver-mounted briar pipes with amber mouthpieces. Major Fred Coutts, general manager, who made the presentation, spoke in felicitous terms of the high qualities of Mr. Kenny as engineer and of his loyalty to the company. They all regretted that he was leaving them. Among Mr. Kenny's many fine qualities, he desired to mention his rare tact in dealing with men on the permanent way, as he had managed that department so efficiently and so carefully that he (Major Coutts) had never on any single instance to interfere. Nor had he ever worried on any occasion of emergency or breakdown if Mr. Kenny was in attendance, for he then knew all would be well.

Mr. J. Kenny, in his reply, said it was a great pleasure to know that he carried with him the good wishes and the esteem of the directors and employees. He rejoiced that their esteemed manager, Major Coutts, had made reference to the good relations which subsisted between him (Mr. Kenny) and his men, as it gave him the opportunity of acknowledging the loyalty and the readiness with which they had at all hours assisted him in whatever had to be undertaken. Mr. Kenny cordially thanked the directors, staff, and general employees for their kindness, and assured them that wherever his lot might be cast, he would ever bear with him pleasing recollections of the years he had been in the service of the Paisley and District Tramway Company.

At the function there was a large attendance of officials and employees, as well as of well-known public men representative of Johnstone, Barrhead, Renfrew, and Paisley.

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Major Henry Mattinson, R.E., A.M.Inst.C.E., Chief Civil Engineer, Manchester Corporation Tramways, has recently arrived home from Syria on demobilisation. Major Mattinson joined the East Land Field Company R.E. (T.) in 1915. After a period as Adjutant, and subsequently as Superintendent of Instruction in Bridging to the Western Command R.E. Training Centre, he proceeded to Egypt, where he was appointed Construction Engineer to the Light Railways Directorate E.E.F. He was responsible for the construction of about 100 miles of 60 cm. and 2 ft. 6 in. gauge railways to various points in the front line, of which a line 20 miles in length due north from Jerusalem and over most wild and rocky mountainous country was constructed at the rate of three-quarters of a mile per day. After the successful advance of the army from September, 1918, Major Mattinson carried out the restoration of the captured Turkish railways to Haifa, Deraa, Damascus, Beirut, and Aleppo, some 500 miles in length, considerably destroyed by the retreating forces, and had the satisfaction of completing this work before being demobilised.

Mr. Robert B. Holt.—We have to announce the departure of another prominent tramway man from the ranks of municipal officials. Mr. Robert B. Holt, M.I.Mech.E., M.Inst.C.E.I., who has been identified with the Leeds Corporation Tramways for many years, has resigned the office of City Highways Engineer and Permenent Way Engineer of the tramways in order to take up an important appointment on the staff of Messrs. C. P. Sandberg, consulting engineers, of Westminster. As announced in our issue of April 11, 1918, Messrs. C. P. Sandberg have developed a process for increasing the life of tramway rails *in situ*, without disturbing the traffic or the pavement. This treatment is now being applied on the Croydon, the Manchester, and the Birmingham tramways. The process will undoubtedly prove of great value to tramways, and Messrs. Sandberg are fortunate in having secured the services of so able and experienced an engineer as Mr. Holt, who not only has special knowledge of tramway track, but has also for many years devoted much attention to the metallurgical question of steel rails. Mr. Holt collaborated with Messrs. Sandberg in connection with the original experiments both of the Sandberg sorbitic process and the Sandberg *in situ* treatment of rails. During

Mr. Robert B. Holt.

the past two years Mr. Holt has been connected with the Admiralty's Labour Department, and for a considerable time held the position of District Director for the North East.

We regret to record the death of **Lieut. Harold Hugh Hirst,** which took place on February 24, at his home, 5, Weymouth Court, Portland Place, London, from pneumonia following influenza. Lieut. Hirst, who was born in 1893, was the only son of Mr. Hugo Hirst, chairman and managing director of the General Electric Company, Limited. At the time of the outbreak of war he was in France. On returning to England he had a serious illness, but immediately on his recovery in October, 1914, he joined the Inns of Court O.T.C., and in March, 1915, received a commission in the 21st Manchester Regiment. After acting as divisional signal officer to the 30th Division in England, in February, 1916, he proceeded to East Africa with the No. 1 East African Special Visual Signal Company. Owing to malaria and dysentry he was invalided home towards the end of 1916. On recovering from a protracted illness, he was transferred in June, 1917, to the Wireless Service, in which he acted as instructor. He proceeded to France in the summer of 1918, and took his share in the operations preceding the armistice. The strain of the campaign, combined with the effects of gas, broke down his health again, and he was invalided home at the end of October.

THE LATE MR. STEPHEN SELLON.

A brief notice of the career of the late Mr. Stephen Sellon was given in our issue of January 16, following his death, which occurred suddenly in December last. For the fuller biographical sketch which follows, and for the accompanying photograph of Mr. Sellon, we are indebted to Mr. Arthur R. Hoare, who, with Mr. S. Rutter Fletcher, in accordance with Mr. Sellon's wish, are continuing his practice.

The late Stephen Prescott White d'Alte Sellon, M.Inst.C.E., was a son of the Rev. W. E. Sellon, of Kentchurch Rectory, Herefordshire. Mr. Sellon was educated at Uppingham School and King's

The Late Stephen Sellon.

College, London. He served his time in the works of Messrs. Hamilton and Company, marine engineers and bridge builders, was a pupil of the late Mr. Meeke (engineer to the Lancashire and Yorkshire Railway), and afterwards became assistant resident engineer on the West Kent Main Drainage Works under Sir Joseph Bazalgette and Mr. Alfred Williams. Subsequently he was resident engineer to Mr. Hennell, on the Darenth Valley main drainage, then joined Mr. Hennell's staff, and took part in many important promotions, including the Barry Railway, the Lancashire plateways, and the Manchester Ship Canal. In 1885 Mr. Sellon turned his attention to light railways and tramways, and was engaged in the promotion of several Irish relief railways. On returning to England he constructed the Wolverton, Stony Stratford and District Light Railways, and the Newport Pagnell and Olney Tramways, the first lines of the description in the country running along the high road and dealing with passengers, goods, and mails.

At this period he was consulted by the Royal Commission on the development of Irish industries, and afterwards went on tour with them. Having satisfied himself of the advantages to be obtained by substituting electric traction for steam and horse traction, Mr. Sellon obtained a concession from the Corporation of Leeds to equip a section of their tramways. The concession was handed over to the Thomson-Houston Company, of America, who equipped and worked the line, this being the first overhead "trolley" system in England. Shortly after the line commenced working the National Telephone Company endeavoured to obtain an injunction on account of the telephonic disturbance which it caused, and Mr. Sellon visited many systems in Europe to collect evidence for the purpose of resisting this attack. The subsequent victory over the telephone company, by the well-known judgment of Mr. Justice Kekewich, and the decision of the Joint Committee of 1893, made the Leeds electric tramway enterprise the starting point of the subsequent development of electric traction in England. Mr. Sellon was shortly afterwards invited by Lord (then Mr.) Bryce to join his Committee on Light Railways at the Board of Trade, the result of the committee's report being the passing of the Light Railways Act of 1896. He then became concerned in the formation of a traction department under the Electric Construction Company, and was afterwards appointed chief engineer to the British Electric Traction Company. He resigned this appointment in 1903 in order to devote himself entirely to his private practice as consulting engineer. Mr. Sellon's work of recent years is well known. He acted professionally for very many Corporations and companies in Parliamentary and arbitration cases, and in the construction and equipment of numerous tramways, light railways, and electric lighting undertakings.

In 1904 he was appointed by the Royal Commission on London Traffic to inquire into and report upon the tramway systems of the United Kingdom, more especially in relation to their effect in solving the housing problem and their function as part of the general system of transit in their respective districts. His extensive and exhaustive report was published in Volume IV. of the Commission's report.

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Mr. Sellon was one of the founders of the Tramways and Light Railways Association in June, 1897, and he was a member of the Council up to October, 1908, when he was elected a vice-president and made an hon. member of the Council. He always took a prominent part in the work of the association.

In 1917 Mr. Sellon undertook in a voluntary capacity the position of District Director of Shipyard Labour for the London and East of England District under the Shipyard Labour Department of the Admiralty, but later, as the volume and anxiety of the work outgrew his strength, he was compelled to resign the position. He then acted as adviser to the department in regard to workmen's trams, trains, fares, and means of transit.

When the Tramways (Board of Trade) Committee was formed later in the same year Mr. Sellon was unanimously elected one of the Tramways and Light Railways Association's representatives thereon. He was the author of several papers in connection with the traction industry.

In failing health for some time, he continued his work contrary to medical advice to the last, and died suddenly from heart failure in the train while returning from Edinburgh to London on December 22 last, at the age of 65 years.

TRAMWAY AND LIGHT RAILWAY NOTES.

BELFAST.

TRAMWAYMEN AND UNEMPLOYED PAY—RESUMPTION OF SERVICES—SPECIFICATIONS FOR NEW CARS.

During the strike of shipyard hands in Belfast the Tramways Committee paid wages to the tramway employees, as they did not leave work of their own accord. When the matter came before the City Council, Councillor Turner, while not disagreeing with the payments, remarked that the men had a right to go to the Labour Exchange like other citizens thrown out of work by the withdrawal of power and light, and make a claim for unemployed pay. On February 16 there was a partial resumption of the tramway service, which had been practically suspended since January 25, owing to the stoppage of the power-station by the general strike. The tramway employees had made a claim for a week's wages in connection with their abortive re-start on the previous Tuesday, and a large majority decided not to work. Later there was interference with the running of the cars. A partial service was given on February 17, and on February 18 the full service came into operation, the men returning on the understanding that they would be paid for the previous week. The Tramways Committee have asked the general manager to furnish them with specifications for new cars to accommodate sixty persons. Councillor Turner, chairman of the committee, says it was questionable whether bogie trucks would be suitable. The committee at present have under consideration the advisability of enclosing the ends of the upper decks and also the platforms.

CARDIFF.

SUGGESTED LINKING OF CARDIFF AND NEWPORT TRAMWAYS.

Addressing the Cardiff Rotary Club, Mr. Arthur Ellis, general manager of the Corporation tramways, suggested that there was no reason why, during the next few years, the Cardiff and Newport tramways should not be linked together. It would be necessary to extend tramways into suburban areas to help toward the developments that must come as part of the scheme for freeing the country from the menace of shortage of food. This would have the effect of relieving the railways and leaving them to deal with the longer distance traffic.

EDINBURGH.

FARES AND CARS—THE PROPOSED ELECTRIFICATION.

Mr. R. S. Pilcher, general manager of the Corporation tramways, has submitted to the Tramways Committee a report on the fares to be arranged when the Corporation take over the undertaking on July 1. The present system could be simplified by reducing the number of stages and aiming at cheap penny fares radiating from the centre of the city. Before the stages can be lengthened the Corporation will require to see some prospect of a reduction in the cost of working. A start should be made with the existing 1d., 2d., 3d., and 1½d. transfer fares. Halfpenny fares, which were discontinued some time ago, should not be granted. Children under four years of age should travel free, and those over four and under twelve should pay half fares. The season tickets, except on the Portobello route, where there is a special reason for their use, are rejected. Workmen should be carried at half fares with a minimum charge of 1d. The report has been remitted to a sub-committee for consideration. A sub-committee is considering the whole question of the provision of new cars. It has been suggested that about fifty cars should be got ready when the Corporation take over the tramways. The idea is that the cars should be so constructed as to be convertible, so that they can be utilised when the system is electrified. The Lord Provost, Sir J. Lorne Macleod, has stated that the Corporation propose to acquire and to run motor omnibuses. The conversion of the tramways to electric traction would cost about a million pounds.

LIVERPOOL.

REINSTATEMENT OF STOPPING PLACES—FATALITY DUE TO CRUSH FOR A CAR—TRAFFIC CONGESTION—THE COST OF NEW CARS—OMNIBUSES TO BE MORE THAN DOUBLED.

Certain stopping stations on Liverpool Corporation Tramways, which were abolished some time ago, have been reinstated, owing apparently to public discontent with the changes. At an inquiry into the death of a woman, who was described as a sufferer from heart disease and bad eyesight, the coroner found that she had died from injury to the brain caused by a fracture of the skull due to an accident. She was attempting to board a tramway car and was knocked down in the crush. Suggestions for the construction of an underground railway are receiving the consideration of both the Tramways Committee and the Reconstruction Committee of the Corporation. One scheme includes underground tunnels linking the outer districts with the centre of the city, in which tramway cars would be run. An alternative scheme proposes the widening of roadways so as to obtain higher speeds with the tramway cars. At a meeting of the Tramways Committee on February 21, Alderman Russell Taylor presiding, it was decided to order 25 new tramway cars and 30 motor omnibuses. When these vehicles have been obtained, the Corporation will have 600 cars and 70 motor omnibuses. Owing to the increased cost of electric tramway cars, which is now about three times what it was in 1913, the committee propose to re-fit some of the old cars with new electrical equipment, which will then be serviceable for some years.

LONDON.

AMERICAN RAILS—ENGINEERING EMPLOYEES' REDUCED HOURS—NEW CROSS-TOWN ROUTE—ACCIDENT CLAIMS.

The Metropolitan Electric Tramway Company in 1916, when British firms were prohibited by Government from rolling tramway rails, ordered a small quantity of rails from the United States. At a recent meeting of the Middlesex Council it was stated that the price, including freight and insurance, was £30 per ton. This compares with a pre-war price in the British Isles of £7 10s. In view of the 48-hour week granted to railway employees, and a 47-hour week to engineering trades throughout the country, the London County Council have accepted the award of the Court of Arbitration providing for the institution of a 47 and a 48 hour week in the electrical branch of the tramways department. In the near future the Council will construct a junction between the tramways in Stockwell Road and Clapham Road, thus enabling a new cross-town service to be given from King's Road, Chelsea, to St. George's Church, Southwark, *via* the Plough, Clapham. During the three months ended December 31, 1918, the Highways Committee reported that they had sanctioned the settlement of 380 accident claims against the Council, the cost having amounted to about £3,418. In three other cases a verdict was given against the Council, in which £99 6s. 6d. in costs had to be paid. Three others resulted in the Council's favour, and one was withdrawn.

MANCHESTER.

WELCOME TO EMPLOYEES RETURNING FROM THE WAR.

The Tramways Committee propose to give their employees a suitable welcome on their return from the war. About 700 men have now returned, and it is expected that before long the number of demobilised tramway men will reach 2,000. The estimated expense to be incurred in the reception amounts to £700. The tramway employees themselves are subscribing £350, the committee will contribute £250, and the men's Athletic Society £100.

NOTTINGHAM.

SUNDAY SERVICES RESUMED—TROLLEY WHEEL REPLACEMENT.

The resumption of the tramway service on Sunday was welcomed throughout Nottingham and the suburbs. It had been suspended owing to the shortage of conductors and coal restrictions. At several curves in Nottingham a trial is being given to a device which assists the conductor in replacing the trolley wheel on the wire. It is a mechanical aid for bringing the trolley in line with the overhead wire, thus enabling it to be speedily set running.

SHEFFIELD.

WORKERS AND INCREASED FARES.

A mass meeting of workers at Hadfields, Limited, have passed a resolution protesting against the increase in tramway fares, and urging that a public inquiry should have been held before the decision was taken. It was maintained that the increase would accentuate the housing difficulty.

WOLVERHAMPTON.

ALLEGED INSUFFICIENT VENTILATION OF CARS.

Complaints have been made of insufficient ventilation of the cars of the Wolverhampton District Electric Tramways, Limited, Councillor Quilliam at a recent meeting stated that an improvement was specially required in view of the prevalence of influenza. He thought that the spread of the epidemic was greatly helped by people travelling in the cars, and suggested that the medical officer of health should write to the company on the matter.

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SHEFFIELD TRAMWAYS WORKING AT A LOSS.

THE CASE FOR HIGHER FARES.—GREAT INCREASE IN COSTS PER CAR MILE.

The general manager of the Sheffield Corporation Tramways, Mr. A. R. Fearnley, in a recent report to the Corporation, states that the present fare of a penny from the centre of the city to the outside terminus has, with certain exceptions, been in force for the past 16 years. The only important exception was the halfpenny fare for half-mile stages, which was discontinued in May, 1917. The cost of operation of the tramways has increased enormously during the past four years. Since March, 1915, the increase in weekly wages has amounted to £145,000 per annum, while the cost of material has enormously increased. The cost of operation for the four weeks ended December 8 last, shows a net loss of £2,581, despite the fact that for the four weeks there has been an increase in receipts of £1,600. Working expenses which in 1915 were 8·7d. per car-mile, in December, 1918, were 16·7d., an increase of 8d. per car-mile. The revenue per car-mile has increased from 10·66d. for the year ended March 25, 1915, to 16·45d. at the present time, an increase in revenue of 5·79d. Comparing this with the increase in working expenses of 8d., there is a net decrease of 2·21d. per car-mile. The increased revenue is obtained largely by overcrowding and without a proportionate increase in working expenses. Such overcrowding will require to be discontinued in the near future by the provision of additional accommodation, and this will mean additional expenditure without a corresponding increase in receipts. It is therefore clear that the department cannot continue to pay its way at the present fares. The increase in the cost of working the motor transport vehicles, which began shortly after the commencement of the war, has continued up to the end of 1918, and in the last six months of that year petrol alone cost 5½d. per omnibus-mile. There has been a loss since September last of ¾d. per mile, and unless the omnibuses are worked at a loss a further increase in fares will be necessary. The Tramways Committee has recently received offers for 50 cars which are urgently required to accommodate the morning and evening traffic. In December, 1916, tenders were obtained for new cars, but the order was stopped by the Ministry of Munitions. The price was then £1,066 per car without electrical equipment; to-day the price is £2,050 per car. This increase of 100 per cent. in cost applies to a large number of articles of equipment which are in regular demand for the maintenance of the undertaking.

INCREASE IN FARES APPROVED.

On February 12 the Council devoted two hours to a discussion of the position of the tramway undertaking. The Tramways Committee recommended an increase in the 1d. fares to 1½d., and this recommendation was approved by the Council with an amendment that the former ½d. fare stages be made 1d. stages and that books of 1½d. tickets be sold.

Sir William Clegg, chairman, moving the adoption of the recommendation, said that the increase was a necessity, for in December last they were working at a loss. In December there was a loss at the rate of £600 per week, and in January at the rate of £700 per week. During the past month to avoid overcrowding they had increased the car service, and there had consequently been a reduction in revenue. Referring to the increased cost of materials, he mentioned that the price of rails had increased from £6 to £17 10s. per ton; cement from £1 14s. to £6 9s. per ton; gear wheels from £3 2s. to £3 15s. per set; oil from 1s. to 3s. per gallon; tickets from 3d. to 1s. 3d. per thousand, while timber had increased 500 per cent. In addition the wages of employees had been increased and shorter hours granted without reduction of pay. The proposed increase in fares would increase the revenue by £188,000, and as the increased expenditure would probably aggregate £135,000, there would be a profit of about £32,000, which he considered a reasonable return on the capital outlay of £1,000,000.

Councillor A. Barton, in moving that the fares should not be increased, said that he could not see why the undertaking should not be subsidised by the rates, for even 6d. in the £ would only make a 1d. on the rent, whereas an increase in the fares would cost much more to the workers. The undertaking had paid £414,000 in relief of rates.

EVOLUTION OF TRAMWAYS.—Mr. F. Bland, of Messrs. Edgar Allen and Company, gave an illustrated lecture on February 24 before the Sheffield Society of Engineers and Metallurgists in the Applied Science Department of Sheffield University, on "The Evolution of the Modern Tramway System." The lecture opened with an account of the earliest attempts at the establishment of a tramway system, commencing with the laying of the lines along the road at the Marble Arch, London, in 1861, and subsequently at Birkenhead. Alluding briefly to the 200 different designs of rails which had been proposed, Mr. Bland showed how these had gradually been reduced to two within 30 years; and then dwelt on the desirability of standardising gauges, cars, etc. In conclusion, he showed various types of the cars now in use on the Continent, in the United States, and in the Dominions.

TRAMWAY AND OMNIBUS EMPLOYEES' DEMANDS.

CONCESSIONS THAT WILL ENTAIL HIGHER FARES.

During the past few weeks representatives of the Municipal Tramways Conference, the Tramways and Light Railways Association, and the National Transport Workers' Federation have held several conferences with the object of reaching an agreement with regard to the demands of the employees. These demands, which have now been somewhat modified, were put forward in December last, and are as follows:—

(1) That the working week shall consist of 44 hours, inclusive of signing on and signing off.

(2) That every employee shall be guaranteed a working week of 44 hours or payment equivalent thereto.

(3) No day's work shall be in excess of eight hours.

(4) In no circumstances shall a reduction in the working day entail a reduction in existing wages.

(5) No spread-over duty shall exceed nine hours, inclusive of meal times or relief.

(6) All national holidays, Sunday, and overtime labour to be paid for at the rate of time and a half.

(7) All employees shall be granted 14 days' holiday annually with pay.

The negotiations, although conducted in a very friendly spirit, have been prolonged and sometimes animated. They have included several discussions with the Minister of Labour, who has been in touch with the proceedings throughout. At the time of writing no definite settlement has been reached, but the prospect of arriving at a mutual agreement which will avoid extreme measures is regarded as encouraging, for at the conference at Manchester on March 7 certain proposals were agreed to by all parties. These proposals will be submitted for ratification at separate meetings of the three bodies to be held during the week ending March 15.

It is understood that the proposals include the concession of a 48-hour week, with wages based on a 57-hour week. This and other concessions will enormously increase the wages bill of the tramway undertakings throughout the country, and will entail a large and general increase in tramway fares, for which the consent of the Government will be necessary.

ALTON AND BASINGSTOKE LIGHT RAILWAY.

Alton and Basingstoke Light Railway, which was one of the earliest promotions under the Light Railways Act, and was constructed by the London and South Western Railway Company, was pulled up during the war and the rails sent abroad. In reply to a question in the House of Commons as to whether the line would be reinstated, Mr. Bridgeman said that the President of the Board of Trade had been in communication with the railway company, and he understood that although they had not yet arrived at a definite decision, they saw no prospect in existing circumstances of the railway being relaid and reopened for traffic in the near future. The general question of improved communication, continued Mr. Bridgeman, was one for the consideration of the Ministry of Ways and Communications when it was established, and in the meantime the President of the Board of Trade could not usefully take any action.

NEW ROLLING STOCK FOR NOTTINGHAM.

Nottingham Corporation Tramways Committee, acting on the advice of the general manager (Mr. J. Aldworth), propose to place orders immediately for 25 new cars at a total estimated cost of about £40,000. These cars will be similar in type to the Nottingham Corporation standard car, which was described and illustrated in our issue of June 11, 1914. Three years ago the committee provisionally ordered a number of new equipments and car bodies to replace those which are worn out, and they hope to obtain delivery of these at an early date. At the present time 17 cars are permanently disabled awaiting the installation of new equipments, and many others require extensive repairs.

HULL TRAMWAYS TO BE EXTENDED.

Hull Tramways Committee have presented a report recommending that the tramways should be carried beyond the city boundaries, and that in any Bill promoted by the Council for the extension of the boundaries to Hessle, Anlaby, Kirk-Ella, Willerby, Cottingham, Preston, and Hedon, powers should be obtained to take the tramways to those places, which are all within a five-mile radius. Steps are to be taken at once to extend the tramways to Newlands Park and Anlaby Road, and over the centre of the city The engineer has been asked to submit a scheme for a tramway along the river front, linking up the docks, quays, and ship-repairing establishments. The views of an outside expert are also to be taken on the Humberside scheme.

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CONTRACTS AND ORDERS.

Mirrlees Watson Company, Limited, are supplying a multi-jector air pump for Pinkston, Glasgow, power station.

Messrs. Ward, Haggas and Smith are supplying a 9½ inch centre lathe at £310 to Bradford Corporation Tramways.

Edison Accumulators, Ltd., have an order from Sheffield Corporation for three 2-ton electric tipping wagons at £1,304.

The British Thomson Houston Company, Limited, have an order from Walsall Electricity Committee for a traction rotary of £3,439.

The British Westinghouse Company are supplying a 3,000 KW turbine, condensing plant, etc., to Stoke-on-Trent Electricity Committee.

Dick, Kerr & Company, Limited, are supplying a turbo-alternator condensing plant and transformer at £133,736, to Glasgow Electricity Committee.

Dick, Kerr and Company, Limited, have received an order for 18 sets of electrical equipment for tramcars from West Hartlepool Corporation.

Hull Corporation has placed an order with Messrs. Youngs, of Birmingham, for a set of hydraulic lifting jacks for lifting tramcar bodies at £285.

Preston Corporation has purchased from Messrs. Hulse and Company, of Salford, a double car-wheel lathe for the car repair shop, the price being £900.

Hurst, Nelson and Company, Limited, of Motherwell, have received an order for ten new tramway car bodies with covers from Dundee Corporation, at a cost of £1,300 each.

The Woods-Gilbert Rail Remodelling Company, Limited, of 170, Strand, London, W.C., are carrying out a contract for remodelling rails on the London United Tramways.

The Brush Electrical Engineering Company, Limited, of Loughborough, have received an order for six bogie type, vestibule front cars and three pairs of maximum traction trucks from West Hartlepool Corporation

The Rail Welding Company, of 119, Victoria Street, London, S.W., are the successful tenderers to Salford Corporation for welding and re-treading 400 joints by the company's electrical process. The value of the contract is approximately £1,000.

Bradford Tramways Committee have recently placed contracts with Dick, Kerr and Company, Limited, for 26 tramway cars with complete equipments, at £1,980 each, and for 52 traction motors, complete with controllers, resistances, and circuit breakers, at £246 each.

Sheffield Corporation have been recommended by the Tramways Committee to accept the tender of the Brush Electrical Engineering Company, Limited, for 50 double deck, top covered, vestibule tramway car bodies and trucks, at £102,500, with 5 per cent. for contingencies.

Manchester Tramways Committee has accepted tenders for the supply of motor trucks, car bodies and rails to the value of £150,000. At a meeting of the committee, Alderman Bowes, the chairman, said that 50 cars were to be erected in the sheds, and 50 to be constructed outside as a first instalment.

J. W. Courtenay, Limited, of Amberley House, Norfolk Street, London, W.C., who for may years have been advertising contractors for the Edinburgh and District Tramways Company, Limited, have now been appointed sole advertising contractors to the Edinburgh Corporation, which will take over the operation of the tramways on June 30, 1919.

Electric Welding Equipment.—In view of the large quantity of rail renewals necessary in the immediate future, the Highways Committee of the London County Council have decided to obtain an electric welding equipment, consisting of a motor generator, switchgear, accessories, and electrodes for the purpose of welding rail joints and making good rail ends which had become worn.

Cardiff Tramways Committee have accepted the following tenders: Boilers, Messrs. Babcock and Willcox, £9,455; feed pumps, Messrs. G. and J. Weir, Glasgow, £370; induced draught plant, Messrs. Musgrave, Belfast, £1,400; steel chimney, Messrs. John Thompson, Dudley, £805; fuel economisers, Messrs. Green and Sons, Wakefield, £1,745; and 4,250 yards of cable from the British Insulated and Helsby Cables Co. at £1,410 per mile.

Messrs. Dick, Kerr and Company, owing to an order being cancelled through the armistice, are in a position to promise delivery to Leicester Corporation of a complete 5,000 kilowatt unit in four and a half months at the price of £82,000. This plant is required at the Aylestone Station in order to deal with the extra load for the next two or three years. At the end of that time it is proposed to remove the plant to a new station to be erected at Freeman's meadow as recommended by Mr. C. H. Wordingham in 1917. Owing to war conditions the Board of Trade refused to sanction an application for a loan to purchase the land, etc., and the Tramways and Electricity Committee intend to recommend the Corporation to renew the application.

PATENT LIST.

Abstracted for "The Tramway and Railway World" from the Official Journal of Patents.

***** If the inventions have been communicated the names of the communicators are given in italics.**

APPLICATIONS FOR LETTERS PATENT.

The number of the patent is given in brackets.

Mechanically propelled road vehicles (2,084)—H. W. Alexander.
Automobile road wheels of the sheet metal type (2,292 and 2,418)—Sir H. Austin, Austin Motor Company, A. J. McCormack and Wolseley Motors, Limited.
Trolley pole heads, pulley brackets, etc. (2,212)—A. Bannister and T. W. Tucker.
Motor vehicles (2,489)—E. H. Belden.
Driving and reversing mechanism for motor vehicles (1,969)—W. Bell.
Motor vehicles (2,111)—M Birkigt.
Change gear boxes for internal combustion motor vehicles (2,206)—D. C. Black.
Variable speed device (2,415)—G. Cookson and W. J. Willmoth.
Side tipping apparatus for motor lorries, trailers, etc. (2,554)—B. W. Coopey.
Means for adapting wheeled vehicles to travel on road or rail (2,048)—E. Culpan.
Suspension of trolley wires of electric railways, etc. (1,984)—P. Dawson and F. W. Fawdry.
Supporting device for electric trolley wires (1,985)—P. Dawson and F. W. Fawdry.
Suspension of conductor wires on electric railways, etc. (1,986)—P. Dawson and F. W. Fawdry.
Mud splashing preventer for motor vehicles (2,277)—J. W. Goddard and S. W. Hazeldine.
Steering apparatus for vehicles (1,938)—J. G. Gray.
Friction driving gears for motor cars (2,082)—A. G. Grice.
Jacks for automobiles (2,364)—Michelin et Cie.
Air operated lifting jack (2,564)—J. M. Miles.
Variable speed transmission gear (2,220)—H. Newbold.
Tramway signal (1,950)—C. H. Oldham.
Sleepers for permanent way (2,591)—C. P Sandberg.
Change-speed gears (2,079)—A. Le G. Southwell.
Variable speed mechanism (2,054)—E. Whiteley and R. Whiteley.
Driving wheels, steering and transmission gear for motor vehicles (2,452)—H. S. Wonham.
Locking device for steering wheel of motor car, etc. (2,822)—M. Chapman and Company and J. K. Ovenstone.
Resilient tires for wheels of motor vehicles (2,981)—T. J. R. Clarkson.
Gear boxes for motor vehicles (3,032)—J. C. Moore.
Direction indicator for vehicles (2,982)—S. G. Mould.
Bonnet locking device for motor vehicles (3,166)—W. T. Osborne and A. Smith.
Railway and tramway wheels (3,096)—Owen and Dyson and A. O. Peech.
Current collectors for street cars (3,168)—A. B. Upham.
Appliances for prevention of skidding for motor omnibuses (3,184)—J. H. Allum and H. J. Loveday.
Motor car radiators (3,793)—T. Antoine.
Rigid coal gas containers for compressed gas for motor vehicles (3,646)—E. J. Buckingham.
Coal-gas carburetter for motor cars, etc. (3,647)—E. J. Buckingham.
Automobile internal combustion engines (3,473)—A. C. Butcher and J. Tylor & Sons.
Change-speed gears (3,257)—J. Carey.
Braking systems (3,656)—A. de Coninch.
Underframes for automobiles (3,574)—A. de Coninch.
Safety appliances or guards for motor vehicles (3,801)—J. Cooke and W. C. Croxon.
Spring suspension of motor vehicles (3,713)—L. E. Cowey.
Signalling device for road vehicles (3,297)—A. Cox.
Device for preventing slipping of motor car wheels on snow, etc. (3,229)—A. B. Crowhurst.
Splash-guards for wheels of motor vehicles (3,774)—E. J. Dexter.
Attachment to trolley of electric tramways, etc., for replacement of trolley on the wire (3,761)—T. Forsyth.
Signalling apparatus for road vehicles (3,652)—H. Fryman.
Radiators for cooling on motor cars, etc. (3,478)—E. C. Gilbody.
Shock absorbers in motor vehicles (3,759)—J. P. MacLean.
Electric tramcar apparatus (3,218)—K. Matsumoto.
Change-speed gearing (3,342)—J. F. Morfoot.
Electric locomotives (3,701)—G. Pestarini.
Lifting jacks (3,543)—G. R. Phipps.
Railway and tramway vehicles (3,402)—J. H. Satchell and W. S. Sommers.
Means for retaining wheels on live axle motor vehicles, etc. (3,796)—T. Thornycroft and J. I. Thornycroft and Company.
Coal gas producing plant for motor vehicles (3,633)—C. J. Waldie.
Universal joints for motor vehicles, etc. (3,729)—F. J. Willmott.
Device to protect controller and motors on electrically propelled vehicles (3,841)—G. C. Adams.

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Motor cars (4,446)—R. W. Anderson.
Transmission systems for motor vehicles (4,028)—J. Bell.
Driving gear of motor vehicles (3,824)—J. L. Hamilton-Blackwood.
Change-speed mechanism (4,031)—A. Boerner.
Fittings for suspension of trolley wires in overhead wire systems of electric traction (4,196)—Brecknell, Munro and Rogers and A. M. Willis.
Compressed air brake apparatus (4,022 and 4,023)—British Air Brake Company and J. W. Cross.
Change speed gears (4,284)—C. Bugaud.
Change speed gears for motor vehicles (4,255)—F. Butler.
Rear signalling devices for road vehicles (4,363)—A. Cairns.
Differential gear for motor vehicles (4,190)—R. Carter.
Diminution of wear of railway rails and wheels (4,171)—H. B. Clapp.
Variable speed gearing (4,074)—I. Cohen.
Means for guiding wheels of trolley heads into overhead wires (3,895)—P. A. Craven.
Rails and accessories (4,212)—W. E. Davies and G. Simoens.
Change speed gearing (4,298)—H. C. Blanc-Garin.
Mechanical device for variable speed transmission (4,341)—T. Humphreys.
Electro-mechanical device for variable speed transmission (4,342)—T. Humphreys.
Variable speed gears for motor cars (4,475)—G. H. Jones.
Power transmission devices for motor cars (4,122)—A. J. MacKay.
Road wheels for motor, etc., vehicles (4,197)—H. S. Morgan and R. E. Morgan.
Rail saving and drilling apparatus (4,024)—W. H. Morton.
Motor vehicles (4,070)—J. Newton.
Self-propelled vehicles (4,447)—T. A. Petrie.
Variable speed gearing for motor vehicles (4,142)—J. E. Preston.
Trolley wheel mechanism of overhead electric systems (4,192)—H. V. Richardson.

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Life guards, brakes, clutches, control arrangements, etc., for power vehicles (3,332)—D. Roche.
Chairs for securing double champigon rails to metal sleepers (3,973)—Soc. Anon. d'Ougrée-Marihaye.
Automobile steering axle and gear (4,248)—W. L. Spence.
Switch apparatus for ignition circuit of automobile (4,176)—E. Tonks and Sons.
Reduction of distortion of electric signalling currents (4,065)—Western Electric Company (*Western Electric Company*).
Mechanical device for variable speed transmission (4,341)—H. H. Wright.
Electro-mechanical device for variable speed transmission (4,342)—H. H. Wright.

SPECIFICATIONS PUBLISHED.

1917.

Shock-absorbing mechanism for use in the suspension of vehicles (16,026—*121,763*)—G. E. Stanley.
High-pressure gas system for motor road vehicles (16,401—*121,764*)—G. H. Robinson.
System of springing automobile vehicles (16,462—*121,765*)—F. W. Lanchester.
Springing of road or rail vehicles (17,027—*121,767*)—F. W. Lanchester.
Railway sleepers (19,297—*121,792*)—W. A. Lockard.
Friction clutches and friction brakes (16,033—*121,981*)—Lancashire Dynamo and Motor Company and H. B. Whitmore.
Wheels for motor vehicles (18,091—*121,988*)—W. L. Bodman.
Automatic signalling devices for attachment upon vehicles (18,173—*121,989*)—T. D. Joeck.
Condensers or radiators for motor road vehicles (19,144—*121,997*)—T. Clarkson.
Lifting jacks for use on motor road vehicles (18,739—*122,216*)—F. L. Rapson.
Stopping and turning indicators for vehicles (12,635—*122,429*)—W. S. Shephard.

1918.

Gas storage reservoirs for use on motor propelled vehicles (108—*121,811*)—E. G. E. Beaumont.
Gas supply apparatus for motor vehicles (274—*121,821*)—H. F. Mordey, F. Mansfield, P. H. Houghton, and W. Lane.
Hydraulic lifting jacks (3,442—*121,866*)—Tangyes, Limited, and E. Johnson.
Electro-mechanical power transmission system (4,131—*121,870*)—Leyland Motors, Limited, and J. G. P. Thomas.
Variable speed forward and reverse gear (5,355—*121,883*)—H. S. Wonham and H. W. Walker.
Radiators used for cooling purposes in connection with the power plant on motor cars (8,987—*121,905*)—E. C. Gilbody.
Carburetters or apparatus for mixing any desired proportion of air with gas or vapour applicable for use on motor cars employing coal gas (301—*122,004*)—B. J. V. A. Flugel and H. F. Webb.
Steering mechanism for motor vehicles (448—*117,802*)—E. H. Belden.
Gas-holders for use on motor vehicles (674—*122,032*)—J. C. Watson.
Street cars (9,809—*122,122*)—A. L. W. Begg.
Bonnets of motor car engines (10,356—*122,127*)—R. Lamb.
Steering gear for motor vehicles (1,194—*122,259*)—J. W. Mackenzie (*F. de S. Carrico and H. S. Hall*).
Means of adjusting track points (2,623—*122,292*)—J. Murray.
Apparatus for change speed of a motor car (13,297—*119,858*)—S. Tamura and M. Watanabe.
Lifting jacks for motor vehicles (19,703—*122,389*)—F. L. Rapson.
Power transmission mechanism (1,006—*122,422*)—P. S. Crowsley.
Railway tie-bars (1,385—*122,480*)—W. A. Campbell.
Variable speed gears (3,037—*122,522*)—B. W. B. Puckle.
Driving and controlling device for automobiles (3,642—*122,530*)—H. G. C. Fairweather (*A. Leffler*).
Jacking apparatus for motor vehicles (3,861—*122,535*)—T. Glover.
Automatic apparatus for lubricating railway and tramway track wheels and rails (20,179—*121,601*)—A. Hofmann.

MUNICIPAL TRAMWAYS ASSOCIATION.

Appointment of General Secretary.

Applications are invited for the position of secretary to the above Association.

The gentleman appointed will be required to devote the whole of his time to the duties of the office. Requisite office accommodation and staff will be provided. Salary according to qualifications and experience, but in any case not less than £750 per annum.

Applications, stating age, experience, and qualifications, should be forwarded to the undersigned not later than Monday, the 24th instant.

Tramway Offices,
32, Blackfriars Street,
Salford.

G. W. HOLFORD,
Hon. Secretary.

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TRAFFIC RETURNS.

Tramway and Omnibus Undertakings in the United Kingdom.

NAME OF COMPANY OR CORPORATION.	1918. WEEKS ENDED. Feb. 2	Feb. 9	Feb. 16	Feb. 23		1919. WEEKS ENDED. Feb. 1	Feb. 8	Feb. 15	Feb. 22		AGGREGATE. Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Aberdare U.D. Council	493	492	491	466	...	522	503	470	473	...	46	23,481	—
Aberdeen Corporation	2,262	2,315	2,167	2,134	...	2,482	2,515	2,390	2,448	...	38	98,666	+ 16,337
Ayr Corporation	337	329	325	331	...	391	391	397	387	...	40	23,828	+ 4,952
Belfast City	...	...	...	...	...	...	...	...	...	...	—	—	—
Birkenhead Corporation	1,851	1,885	1,931	1,943	...	2,054	2,022	1,946	2,058	...	47	102,406	+ 15,353
Blackburn Corporation	1,638	1,570	1,453	1,444	...	1,588	1,620	1,685	1,662	...	47¾	83,061	+ 12,869
Bradford Corporation	7,226	7,018	7,432	7,987	...	9,072	9,064	8,583	9,190	...	47	434,765	+ 75,339
Burnley Corporation	1,938	2,023	1,977	1,957	...	2,484	2,616	2,596	2,583	...	—	—	—
Burton-on-Trent Corporation	376	386	377	370	...	399	395	382	415	...	47	19,413	+ 4,142
Bury Corporation	1,585	1,551	1,649	1,612	...	1,935	1,947	1,962	1,982	...	47	95,820	+ 18,666
Chatham and District	1,114	1,163	1,227	1,090	...	1,175	1,086	1,097	1,143	...	7	8,432	+ 131
Cork Electric	573	585	604	587	...	525	529	526	532	...	7	3,907	— 277
Derby Corporation	1,306	1,251	1,292	1,257	...	1,403	1,402	1,401	1,423	...	47	70,194	+ 12,721
Dundee City	1,564	1,723	1,729	1,537	...	1,982	1,956	1,949	1,896	...	40	78,223	+ 15,511
East Ham Corporation	1,333	1,333	1,357	1,230	...	1,468	1,590	1,531	1,505	...	46¾	73,455	+ 9,430
Glasgow Corporation	26,610	26,754	26,278	26,957	...	27,868	27,418	26,490	27,077	...	38¼	1,089,536	+ 82,640
Glossop (Urban Elec. Supply Co.)	181	181	180	188	...	211	206	202	229	...	8	1,660	+ 242
Halifax Corporation	2,316	2,109	2,164	2,279	...	2,668	2,629	2,531	2,506	...	46¼	130,524	+ 17,668
Halifax Corp. Motor Omnibuses	53	48	53	52	...	68	66	63	65	...	46¼	3,107	+ 814
Huddersfield Corporation	3,143	3,119	3,309	3,577	...	3,528	3,548	3,353	3,511	...	47	170,154	+ 21,236
Ilford U.D. Council	...	...	789	745	...	...	...	954	989	...	47	47,111	+ 11,346
Ipswich Corporation	575	600	614	608	...	604	639	653	658	...	47	34,850	+ 3,762
Isle of Thanet	200	200	187	170	...	257	257	309	274	...	20½	6,340	+ 2,752
Kilmarnock Corporation	224	217	221	226	...	265	275	263	265	...	40¾	10,811	+ 2,433
Lanarkshire	2,952	3,137	3,210	3,314	...	3,595	3,480	3,380	3,374	...	7	26,813	+ 4,365
Lancashire United	...	...	...	...	...	...	...	...	...	...	—	—	—
Leeds City	10,728	10,830	11,373	11,030	...	13,734	13,647	13,243	13,464	...	47	635,590	+119,083
Leicester Corporation	4,215	4,285	4,187	4,174	...	4,863	4,743	4,743	4,812	...	—	—	—
Leyton U.D. Council	1,744	1,735	1,862	1,641	...	2,376	2,292	2,413	2,368	...	47	111,528	+ 23,884
Liverpool Corporation	16,689	16,644	16,583	16,667	...	19,361	19,244	18,762	19,438	...	7¼	148,128	+ 23,712
Llandudno and Colwyn Bay	236	253	242	249	...	267	290	284	288	...	12	3,510	+ 746
London County Council	53,718	52,780	56,201	51,918	...	66,553	66,271	67,317	64,025	...	46¼	3,081,229	+523,011
Maidstone Corporation	247	243	247	232	...	261	245	258	265	...	46¼	13,255	+ 1,732
Manchester Corporation	23,576	23,080	23,468	23,546	...	26,478	27,757	26,500	26,322	...	47	1,228,089	+233,683
Newcastle-on-Tyne Corporation	8,454	8,447	8,593	8,480	...	8,145	7,840	7,685	7,730	...	47	416,306	+ 45,087
New St. Helens and District	...	...	...	...	...	...	...	...	...	...	—	—	—
Northampton Corporation	866	923	895	882	...	957	950	932	972	...	41	41,749	+ 1,976
Nottingham Corporation	4,943	4,740	4,824	4,706	...	5,832	5,813	6,274	6,202	...	47	270,646	+ 59,416
Oldham Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
Reading Corporation	1,065	1,109	1,166	1,121	...	1,247	1,233	1,237	1,309	...	46¼	60,603	—
Rhondda Tramways	1,650	1,582	1,591	1,560	...	1,997	1,907	1,929	1,999	...	7	14,733	+ 3,627
Rotherham Corporation	1,948	2,053	2,002	2,051	...	1,971	1,987	1,917	2,071	...	47¾	108,133	+ 20,663
Sheffield Corporation	12,851	12,933	13,190	13,098	...	12,368	12,529	12,248	12,347	...	47¾	631,416	+ 48,299
Southampton Corporation	2,230	2,242	2,292	2,176	...	2,197	2,135	2,193	2,173	...	46¾	116,736	+ 19,559
Southend-on-Sea Corporation	674	671	711	625	...	1,032	969	1,020	1,022	...	47	60,948	+ 20,139
South Shields Corporation	...	...	1,036	...	...	...	...	1,131	...	...	46	52,960	+ 8,639
Sunderland Corporation	1,933	1,985	2,001	2,029	...	2,344	2,341	2,536	2,625	...	47	103,887	+ 16,092
Swindon Corporation	282	288	292	287	...	282	198	276	282	...	46¾	14,237	+ 1,471
Torquay Tramways	703	657	653	657	...	657	608	689	628	...	7	5,041	+ 315
Tyneside Tramways and Tramroads	879	848	...	...	...	797	785	...	...	...	6	4,238	+ 84
Wallasey Corporation	1,437	1,430	1,456	1,458	...	1,879	1,848	1,774	1,840	...	46⅝	88,111	+ 14,660
Walsall Corporation	1,079	1,112	1,082	...	...	1,211	1,202	1,202	...	...	49	57,053	+ 10,850
Walthamstow U.D. Council	1,096	1,170	1,186	1,094	...	1,252	1,252	1,307	1,306	...	47	67,253	+ 10,269
Warrington Corporation	742	752	759	744	...	837	826	803	815	...	47	36,572	+ 8,396
West Ham Corporation	3,534	3,551	3,736	3,377	...	4,478	4,445	4,535	4,637	...	46¼	213,917	+ 43,204
Wigan Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—

*** A number of undertakings have suspended the issue of traffic returns for the duration of the war.

Colonial and Foreign Tramway Traffic Returns.

NAME OF COMPANY.	1918. WEEKS ENDED. Feb. 2	Feb. 9	Feb. 16	Feb. 23		1919. WEEKS ENDED. Feb. 1	Feb. 8	Feb. 15	Feb. 22		AGGREGATE. Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Anglo-Argentine	50,620	55,428	53,304	54,377	...	58,942	60,269	57,780	58,997	...	8	428,987	+ 5,843
Calcutta Rs.	71,333	72,140	71,419	72,650	...	82,762	85,090	88,182	87,371	...	7¼	657,946	+104,540
Madras Rs.	...	(2 weeks)	37,363	...	...	...	(2 weeks)	43,299	...	...	6	131,355	+ 15,714
Pernambuco	4,759	4,759	4,927	4,438	...	5,497	5,397	5,098	4,879	...	7½	40,496	+ 2,867

Companies issuing Monthly Statements only.

	1917. Sept.	Oct.	Nov.	Dec.	1918. Jan.	Feb.	1918. Sept.	Oct.	Nov.	Dec.	1919. Jan.	Feb.	Wks.	AGGREGATE. 1918-19.	+ or —.
	£	£	£	£	£	£	£	£	£	£	£	£		£	£
Ballarat & Bendigo	3,072	3,546	3,405	3,228	4,505	...	3,430	3,690	3,570	3,884	4,504	...	40	35,478	+ 2,167
Brazilian Trac. Mlrs	7925000	8006000	7695000	...	...	...	9081000	8052000	7581000	...	...	...	47	93,363,000	+9,232,000
Brisbane	31,600	33,580	32,901	35,019	34,500	...	35,400	36,780	39,246	38,135	38,575	...	4	38,575	+ 4,075
British Columbia $	457,709	491,964	525,629	555,555	559,569	...	575,476	580,354	612,893	691,065	667,489	...	30	4,095,584	+ 612,355
Buenos Ayres L'c'z.	33,655	39,067	39,678	40,901	38,902	...	41,006	41,843	42,952	50,460	41,556	...	30	300,780	+ 31,403
Burma	26,167	28,955	27,760	26,224	25,430	...	30,836	34,848	34,407	34,593	38,265	...	26	214,804	+ 53,554
Cape Town	...	17,128	16,522	...	...	...	17,872	13,877	18,385	...	...	...	—	—	—
Carthagena & H.	4,306	2,805	3,932	4,424	4,011	4,031	2,549	2,525	2,988	2,950	3,655	2,351	8	6,006	- 2,036
Cordoba	...	...	...	...	...	...	...	...	...	...	...	...	—	—	—
East India	1,512	1,229	871	1,099	1,176	...	1,939	2,044	1,947	2,048	1,970	...	26	11,923	+ 4,474
Kalgoorlie	3,063	2,795	...	...	...	...	2,947	2,835	...	...	...	...	43	27,905	+ 982
La Plata	3,450	4,069	3,742	4,606	4,711	4,746	4,999	5,177	5,334	5,792	5,730	5,698	8	11,428	+ 1,971
Lima	35,636	37,612	37,249	43,198	...	...	42,861	45,336	44,948	47,887	...	...	52	527,839	+ 87,587
Manaos Rs.	...	...	...	...	...	...	...	...	...	...	...	...	—	—	—
Manila $	152,200	157,400	159,000	...	...	...	204,500	214,898	214,292	...	...	...	48	2,090,630	+ 466,897
Monte Video	29,426	30,153	...	34,025	36,016	34,573	...	33,203	...	38,441	40,910	38,772	17	149,821	+ 14,147
Peruvian $	950,740	1047220	899,680	1101090	1189350	...	957,910	1090815	897,090	1057990	1009650	...	30	7,030,365	— 247,255
Para	...	...	...	23,315	24,060	...	...	...	...	23,800	24,515	...	8	48,315	+ 940
Port Elizabeth	...	3,885	3,807	...	...	...	3,661	2,751	3,498	...	...	...	—	—	—
Rangoon	5,163	5,667	5,358	5,438	5,361	...	6,067	6,566	6,611	6,188	6,373	...	4	6,373	+ 1,012
Toronto $	1023517	1043886	1052000	...	1068319	...	1119925	1048478	1071106	...	1106840	...	4	1,106,840	+ 38,521
Winnipeg $	267,170	301,772	305,881	...	334,642	...	285,670	295,005	283,721	...	390,539	...	4	390,339	+ 55,897

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The Daimler Two-Tonner sets the standard for Commercial Motor Vehicles

"AS good as a Daimler" is a well-known phrase of recommendation.

The reliability of Daimler Commercial Vehicles is an axiom in motor transport circles, and their cost of maintenance is the lowest known.

The Daimler is not the only serviceable lorry on the road, but however good other vehicles may be they must all fall short of Daimlers in relation to engine performance and continuity of service.

The Daimler standard of efficiency is only within the scope of the Daimler Sleeve-Valve Engine.

Daimler

The Daimler Company Ltd.
Coventry

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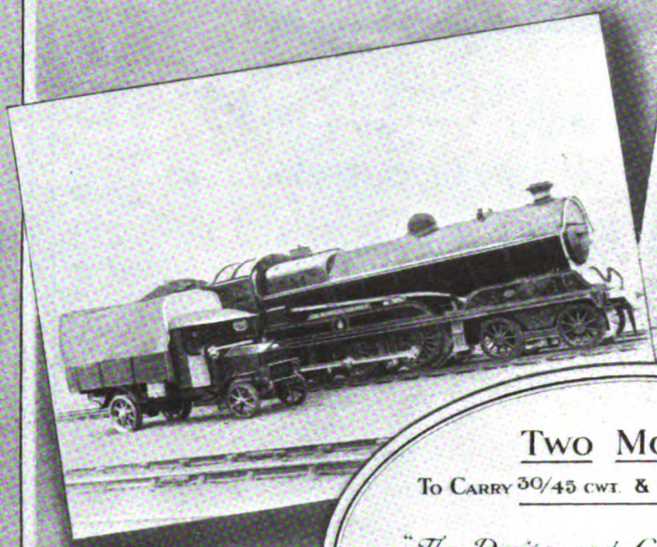
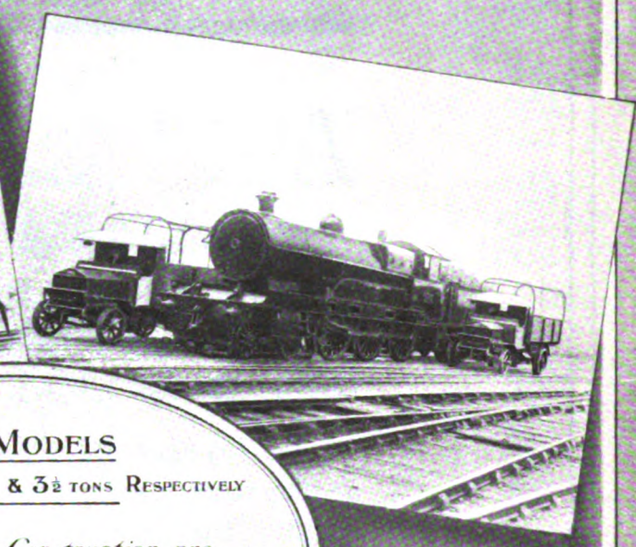
MOTOR VEHICLES.





TWO MODELS

TO CARRY 30/45 CWT. & 3½ TONS RESPECTIVELY

"The Design and Construction are Throughout of a Character, which it would be Exceedingly Difficult, if not Impossible, to Improve Upon."

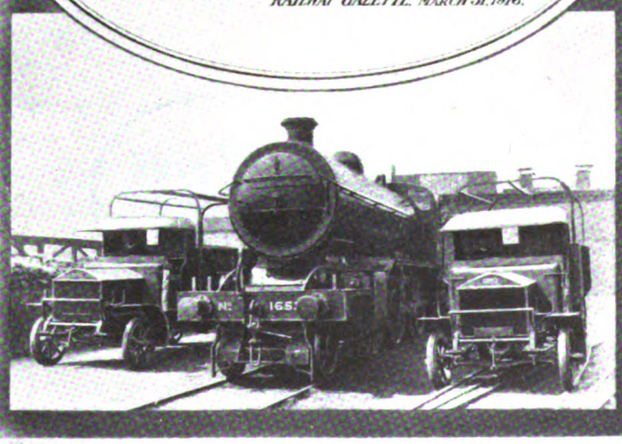
RAILWAY GAZETTE, MARCH 31, 1916.

IN PEACE

USED BY THE LARGEST CARRYING COMPANIES AND COMMERCIAL HOUSES.

IN WAR

USED BY THE BRITISH AND ALLIED GOVERNMENTS.



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WORKS
ACTON, LONDON. W

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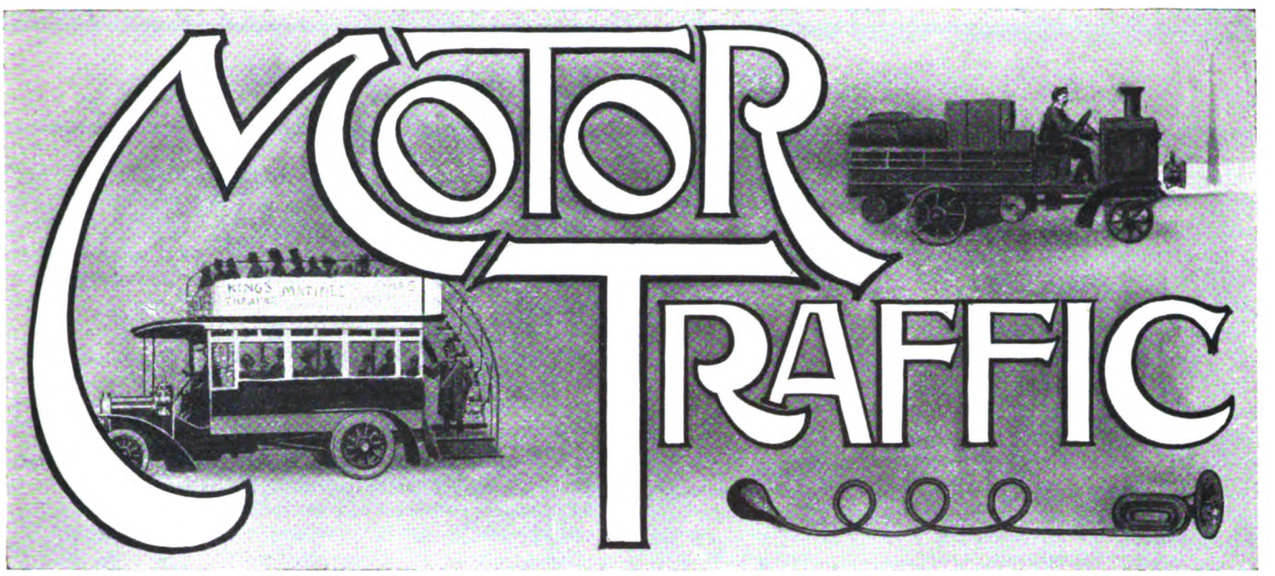

MOTORISTS DEMAND A SEPARATE MINISTRY FOR ROADS.

During the past few weeks a very wide and powerful opposition has been organised to the intention of the Government that the new Ministry of Ways and Communications should absorb the Road Board and its functions. The opponents, taking a somewhat sectional view of the matter, demand a separate Ministry for roads. The Automobile Association and the Society of Motor Manufacturers and Traders have collaborated to form a body known as the Motor Legislation Committee, which has very considerable funds at its disposal, and is engaged in active propaganda and organisation which for the moment is concentrated on the question mentioned above. The Parliamentary Committee of the R.A.C., though not definitely collaborating with this new body, is at one with it on this particular question of policy. So also is the Federation of British Industries, which has very wide interests that cannot be accused of bias in favour of any one system of transport, and should be able to get a good hearing for its views. In the House of Commons itself a Road Transport Committee has been formed. This Committee has elected a strong Executive, and has appointed Mr. Joynson Hicks to act as its chairman. It is stated that the Committee now numbers more than two hundred Members of Parliament, and that it will actively oppose any attempt to include the control of roads in the powers of the new Ministry. Possibly by the time these notes appear in print matters will have progressed very much further. At the moment it is impossible to see what will be the final arrangement reached. It is conceivable that in some form the Road Board may be allowed to continue an independent existence, but if the Government adhere to their present intention the opposition should at least be strong enough to ensure the introduction of such safeguards as will effectually protect the future of roads and road transport.

SALE OF SURPLUS MOTOR VEHICLES.

Several steps have been taken in the direction of the solution of the surplus vehicle problem since we last made reference to it. For months, and even years, motor manufacturers, retailers, and users who desired to see this problem properly solved were to all intents and purposes unable to produce any results because there really existed within the Government no organisation competent to take executive action. The consequence was much talk but nothing done. Sooner or later, of course, it had to be realised that it was impossible to let the matter stand over indefinitely. The whole question of the disposal of surplus Government stores was then referred to the Ministry of Supply, formerly the Ministry of Munitions. A new and improved Surplus Government Property Disposal Board was set up to act as a supreme direction body. Within the Ministry there were constituted a number of Executive Departments, each one charged with the work of disposing of stores of a certain class. It is not, however, left to the Executives to determine the method of disposal. In conjunction with each Executive there has been formed an Advisory Committee so constituted as to include representation of the interests most deeply affected. This Advisory Committee makes recommendations on all matters of general principle. Presumably these recommendations will in nearly every instance be endorsed by the Board, and the Executive Departments instructed to act upon them. In the particular section that concerns us, the Executive Department is under the charge of Colonel Holbrook, Director of Mechanical Transport, who has shown himself a very competent organiser. The Advisory Committee includes Mr. H. C. B. Underdown, the president of the Association of British Motor and Allied Manufacturers; Mr. L. Walton, representing private car manufacturing interests; Mr. Mobbs, representing the retailers; Mr. Orde, of the R.A.C., and other names well known in the motoring community. It may fairly be assumed therefore that this Advisory Committee will not come to any unanimous resolutions of a kind likely to jeopardise unduly the interests of the motor industry and trade, or the ability of motor manufacturers to face the very difficult problems of the future connected with the employment of labour. The bulk of the surplus vehicles awaiting disposal consists of substantial motor lorries. These may be divided into three big groups. The first consists of new vehicles that have never seen service; the second of vehicles of modern type that have seen service but are still in good workable condition; the third of vehicles of obsolete type, together with vehicles of more recent type, the condition of which is such as to render very comprehensive repairs necessary, if repairs are justifiable at all. In some ways the problems of the new vehicle and of the very old vehicle present fewer difficulties than the main problem of the serviceable vehicle. With regard to the last-named, we have the big question of whether the

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vehicles should be repaired before any attempt is made to sell them, and if so, whether the repairs should be entrusted to the original manufacturers. The Advisory Committee has not yet been sitting long enough to evolve any complete scheme, but we learn that considerable progress is being made.

A RESEARCH ASSOCIATION FOR THE MOTOR INDUSTRY.

The motor industry will, unless some unexpected obstacle interferes, soon be in possession of its own Research Association, able to operate with considerable funds and with the assistance of a valuable measure of Government support. The existence of a general Research Association of the industry does not in any way diminish but really rather increases the need for the existence of Research Departments within the organisations of individual firms. Co-operative research must be on broad lines, aiming mainly at the establishment of general principles, the conduct of lengthy and expensive investigations beyond the power of an individual, the examination of properties of special alloys and materials, and so on. When the general research has established its principles or given exact knowledge of the qualities of certain materials, then it is for each manufacturer severally to apply the information thus gained to his own advantage. This means specific research bearing directly upon design. Without individual effort the results of co-operative research must necessarily be very limited. With it they should be at least considerable. It is, of course, conceivable that they may be actually revolutionary. Thus the conduct of an investigation lasting perhaps for three years, and involving an expenditure of five thousand pounds per annum, would probably be regarded by a single firm as uncommercial, especially if direct results could only be looked upon as a doubtful possibility. Thus the scheme of co-operative research encourages the conduct of work which would otherwise never be undertaken at all, and it is by no means impossible that such work may lead to discoveries of the highest value, having an incalculably beneficial effect on vehicle design. We hope that the Research Association will be well supported by the industry, because through its agency British manufacturers have an opportunity of making exceptional progress calculated greatly to strengthen their position in international markets.

ENCOURAGEMENT OF OVERSEAS TRADE.

It has been evident for some time past that there would be great difficulty in finding markets for the much enlarged output of the British motor industry unless something tangible were done to encourage the overseas demand. In some quarters British manufacturers have been criticised for an apparent lack of interest in this important matter. It is evident that the subject has been receiving very careful consideration, since we are now informed that the industry is sending out a commissioner to make a special study of certain of the more promising markets, and to endeavour to establish closer and more friendly relations between the industry at home and the possible client abroad. The commissioner has already left this country, and his tour will embrace India, Ceylon, Burma, Malaya, Siam, China, Japan, Australia, and New Zealand. The direct and immediate results of an investigation of this kind should be well worth having, but it is to be hoped that the move means something more than is apparent upon the surface, and may lead to the establishment of some concrete organisation enabling the interests of the motor owner overseas to be better watched and served by the manufacturer at home. In the past one of the main grievances has been connected with delays in deliveries, and particularly as regards the supply of spare parts urgently needed. Doubtless many of the larger firms are now taking steps to remedy any such faults in their organisation, but it would certainly seem that there will in any case remain plenty of scope for co-operative action by those who, for one reason or another, would not be justified in creating a world-wide organisation on their own account. The commissioner has the active support of the Overseas Trade Department of the Government, and should thus be in a position to get a hearing for any views that he may be instructed to put forward. It is conceivable therefore that his tour may lead to acceleration in the progress of road construction in some parts of the world. It may be a good thing to have motor vehicles to travel where roads do not exist, but it is a still better thing to have a good road system on which any well constructed vehicle can work with the maximum of efficiency and economy.

ROAD PROJECTS AND OMNIBUS TRAFFIC.

FROM A CORRESPONDENT.

The conditions under which motor omnibuses shall be permitted to use the roads has been a subject of fierce controversy from the time that such vehicles commenced to run. This controversy, unfortunately, tends to become more, rather than less, acute as time goes on. It cannot be helped, for the simple reason that the question does not stand alone, but is bound up very intimately with another and much wider issue, in itself a subject of lively and indeterminate debate.

Until you have settled the great question of the roads, the standard to which they are to be built, their administration and finance, as a whole it is impossible to lay down any general rules as to the terms upon which omnibus enterprise should be allowed to operate as regards liabilities for wear and tear of the highways. The position created by the Local Government (Emergency Power) Act is not a very satisfactory one. It certainly is not ameliorated by the recommendation made by the Select Committee on Heavy Motor Traffic that its provisions as regards the powers of local authorities to impose contributions upon omnibus enterprise for road maintenance should be made permanent. The only reasonable ground on which this contribution—which has become more or less standardised at ⅜d. per omnibus mile—can be levied is that it represents the approximate extra expenditure likely to arise on account of the use of the roads by omnibus traffic as compared with the normal previous cost. The mere adoption of this arbitrary standard rate is enough to render it suspect in principle. But the powers of veto conferred by the Emergency Act give to local authorities this instrument of pressure upon those wishing to establish omnibus services on new routes, and in practice its operation is hardly distinguishable from blackmail. In any event, the basis of the contribution is illogical and unfair, and the fact that whether it is levied or not is a matter of local prejudice only serves to emphasise these characteristics.

The whole subject of motor transport in its relation to roads and road reconstruction, and the extent to which it should be called upon to share in the cost thereof, is now in process of consideration, and for that reason alone no attempt should at present be made to stabilise the conditions to apply to omnibus traffic apart from the rest. It may be decided to levy a general tax upon heavy motor vehicles. To this tax omnibuses would be liable, and if the provisions of the Act of 1916 be retained they would be in the position of paying twice over for the right to use the roads. But even in the absence of any such general impost, the justice and the expediency of taxing omnibuses specially is open to serious question—at all events as a permanent measure.

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Where the needs of a locality are so far developed as to call for the establishment of a regular omnibus service, it may be taken for granted that there will be an appreciable amount of heavy motor traffic there too. This degree of development, and this traffic, will sooner or later make it incumbent upon the local authority to bring its roads up to the standard suitable for such traffic. This obligation upon a local authority of keeping its roads in a state fit to bear the traffic that may reasonably be expected upon them has virtually the force of law. Where roads are suitable for heavy traffic omnibuses do them no harm. The experience of some of the London boroughs has clearly established this to be the case. On the other hand, where roads are not for the time being of a standard capable of bearing other than comparatively light traffic, the mere fact that new omnibus services are required to run over them is a precedent to conditions in which the necessity of making them fit for heavy self-propelled vehicles. In practice omnibus traffic rarely stands alone. It is certain to be accompanied sooner or later by other heavy traffic, the total volume of which will considerably exceed that of the omnibuses. Yet the latter only, under the Emergency Act and its proposed continuance, are to be locally taxed in respect of road maintenance, while the miscellaneous traffic goes free.

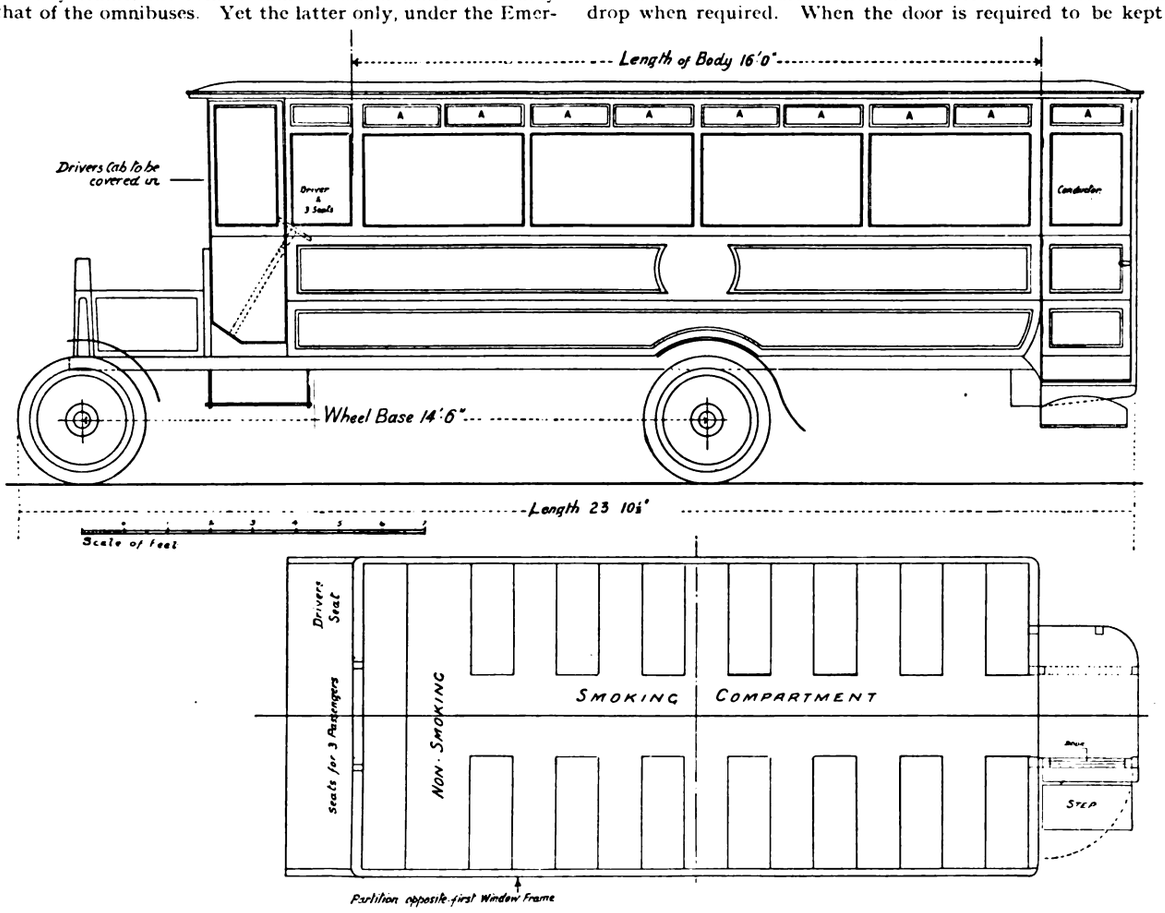
It may be desirable to give local authorities the right to determine, within limits, whether certain kinds of traffic shall or shall not run over certain roads within their jurisdiction, and their licensing powers must obviously remain. But the whole question of heavy traffic and the roads, and of special taxation, should be dealt with nationally and not locally. If in our national reconstruction programme we decide on a standard of main road construction that will be fully adequate for heavy motor traffic, it follows that all roads scheduled as "main" will be fit to carry omnibus services without special damage, and therefore the need to impose special maintenance contributions will disappear. This would leave only a comparatively small mileage of secondary roads carrying omnibus traffic, as to which a case for temporary contributions might exist until such time as these roads were promoted to the category of main roads with the corresponding higher standard of construction. To this extent the principle of the ⅜d. per mile might perhaps be retained, but its retention indefinitely can hardly be defended.

LIVERPOOL'S NEW OMNIBUSES.

SPECIFICATION OF VEHICLES TO BE SUPPLIED BY THE A.E.C.

With so many Corporations desiring to purchase motor omnibuses, the design adopted by the Liverpool Corporation Tramways department for 60 single-deck omnibuses that have been ordered from the Associated Equipment Company, Limited, are of special interest. By the courtesy of the general manager (Mr. C. W. Mallins) of the Liverpool Corporation Tramways, we are enabled to give some particulars and a plan and side elevation of these omnibuses, which, as will be seen, embody several novel features.

Exclusive of rear platform and the driver's compartment, the length of the body is 16 ft. and the wheel base 14 ft. 6 in. The driver's enclosed compartment is provided with high front side doors, with slam lever locks and top triggers. The door to the rear end is at the near side, fitted with slam lever locks, with outside and inside brass handle. The window fitted to this door is made to drop when required. When the door is required to be kept open it will be held in position with a spring catch. The double steps to the driver's seat and the rear end of body will be covered with linoleum and fitted with iron tread plates.



Plan and Elevation of Omnibuses now being Constructed for Liverpool Corporation by the Associated Equipment Company.

The front of the body over dash is to be panelled up, with two fixed lights on each side, and in the centre a glass screen to be supplied, divided into four, the off-side top portion of screen (in front of driver) to be fitted with brass joints, the top part made to swing outwards; all this framing to be in mahogany, stained and polished. In the interior the body is to be finished off in natural wood, varnished, including the roof. For lighting, the two head, two side, and two tail lamps, six lamps inside the body, and two lamps over the destination boards, front and rear, will derive current from a C.A.V. dynamo electric lighting 12 volts set, and large 12-volt batteries, fitted in a box at side of the body. An electric bell will enable the conductor to communicate with the driver.

The Tylor engine will be of four cylinders, 5-in. bore by 6-in. stroke, developing 45 B.H.P. at 1,000 revolutions per minute; fitted with Thomson-Bennett magneto and Acme carburetter; pump circulation and pressure-feed lubrication. The aluminium cone

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clutch will be of large diameter, with Ferodo liner and encased volute spring, the thrust being self-contained when clutch is in. The clutch operating gear will be a standard type pedal shaft mounted on spherical bearings to ensure easy operation. The four-speed and reverse speed gear will be contained in a box of very stiff construction, the gears being of the highest quality steel and fitted with ball bearings throughout. The gate change-speed gear is of the selector type, with pedal operated reverse safety catch, the change-speed shaft being mounted on spherical bearings. On the front cardan shaft there will be flexible couplings of leather or rubber, and on the rear cardan shaft ball or roller bearing universal joints of special design.

The front axle will be H section stamping of high quality steel. Swivel axles are of 60 ton steel with floating bushes for road wheels. The tire size is 1,010 by 120 fitting British standard, 850 mm. rim diameter. Similar size twin tires are fitted for rear axle. In the YB type the rear axle is fitted with Lanchester worm and, in the YC with David Brown worm, having a gear ratio of 8¼ to 1. Roller bearings are fitted in the rear hubs, and the drive is through castellated high quality nickel chrome steel shafts. Foot and hand brakes of the usual type operate on independent drums on the rear wheels.

Steering will be by worm and nut type gear, with ample bearing surface everywhere, ensuring exceptionally long life, fitted with 18 in. ebonite covered wheel. Springs are all of chrome vanadium steel, with specially stiffened eyes, a volute spring being fitted over the rear axle. The frame is of high tensile steel, $\frac{9}{32}$ in. thick, fitted with high tensile cross members of great strength. A 30-gallon tank (fitted with needle valve) is placed under the driver's seat. Wheels are of steel castings of exceptionally strong design. Delivery of the vehicles will be taken at the Walthamstow works.

OVERSEAS MOTOR TRADE.

A Commissioner's Tour of the Markets.

The Association of British Motor and Allied Manufacturers have appointed Major R. E. Goddard as their overseas commissioner for the purpose of conducting a tour of investigation of the markets of Australasia, India, and the East. Major Goddard left this country at the end of February, and his tour will embrace Ceylon, the Dutch East Indies, Australia, New Zealand, Japan, China, Malaya, Burma, and India, in the order named. He will reach Ceylon about the middle of March, and the whole tour will occupy about a year. From this it will be possible to gauge roughly the dates of his arrival at other points, though it is not, under present circumstances, possible to state them accurately in advance.

Major Goddard has been appointed, after consideration of the claims of applicants numbering well over a hundred. He has made a special study of overseas commerce, with regard to which he has a wide and varied experience, especially in connection with the motor industry. Many of his conclusions have already been published in his book "General Cargo," a volume dealing with the organisation and political economy of the export trade and with the cultivation of foreign markets. He is, moreover, a trained engineer.

Although Australasia and the Far East form the objective of the immediate campaign, it is probable that operations will be extended to other territories in the event of the results of the first tour being as satisfactory as are anticipated. It is hoped that the results of the tour will be very considerable and that, through Major Goddard's reports, the British industry will be enabled to gauge with much greater accuracy the general or average requirements of foreign markets, both as regards type of vehicle and as regards the most acceptable methods of doing business.

The association is acting in conjunction with the Overseas Trade Department of the Government, which is assisting in every way, partly as regards finance and partly as regards official introductions and shipping arrangements.

MOTOR EMPLOYERS' FEDERATION.

The National Council of the Commercial Motor Users' Association has been informed that the Government will shortly require employers to join a suitable federation in order to regularise dealings with labour. The Council has accordingly entered into an arrangement with the Motor Transport Employers' Federation under which the new conditions can be met by haulage contractors and other owners of commercial motor wagons or vans. Mr. F. G. Bristow, who is secretary to the two bodies, can be addressed at 83, Pall Mall, London, S.W.1, for fuller information.

ROAD MOTOR TRACTION.

EVIDENCE BEFORE THE COMMITTEE ON TRANSPORT.

An abstract of the evidence given before the Committee on Transport shortly before the close of last session of Parliament was published in our issue of February 13, 1919. The following is a summary of interesting testimony laid before the Committee in reference to road motor transport and omnibuses:—

Sir William Marwood, joint permanent secretary of the Board of Trade, stated that the Board set up a Road Transport Board as a war measure entirely. Before the war the Board of Trade had nothing to do with road transport, except on a very small matter. The weight of motor vehicles and all that sort of thing is a matter for the Local Government Board, and the only control the Board of Trade had on road transport is that certain owners of bridges have power to limit the weights of vehicles passing over them, and in the case of railway bridges a complaint if made is adjudicated on by the Board of Trade; in the case of any other bridges it is not a matter for the Board of Trade. Certain Corporations have taken power to run motor omnibuses, and Parliament has put in a provision that the fares are to be approved by the Board of Trade. He did not know why they put in "The Board of Trade," but they did it, and when it is in you cannot get it out again. In one case at least—namely, Eastbourne—the Board of Trade have power to approve the route. Everybody wants a motor omnibus to run down the next street and not down his own street. A limited company wants no power to run motor omnibuses at all; they can run them as they like and anywhere they like. The police have some authority in London as to the routes.

As to setting up a motor omnibus undertaking, a limited company can do it without any statutory power at all, whereas a Corporation cannot, because it cannot spend capital except on certain authorised objects, so it has to go to Parliament.

Asked whether it is not the rule in provincial towns for the Corporation to have absolute authority as to preventing any omnibuses from being run, Sir William said there is only one way and that is they can refuse to license the vehicles. Under the Local Government Emergency Act, 1916, however, there is the power to stop new routes, but not to stop existing routes.

WORKMEN'S FARES.

In regard to workmen's fares on motor omnibuses, the difficulty is that if you fill up the omnibuses with passengers paying fares anything approaching the London County Council's workmen's fares you would be running your omnibuses not at an estimated loss, but at an actual loss. Without taking in the cost of administration, or anything of that sort, on your petrol bill you would be running at a loss. In normal times a motor omnibus would be losing at the County Council fares, or at any fares like they have on the Great Eastern of 2d. to East Ham, or 20 miles for 2d.—any fares like that would kill a motor omnibus service; but taking the case of a railway with a train full of workmen in normal times on normal costs of working, those trains are not run at a loss. Some railway companies would argue that they are, but his own opinion was that a full train does not run at a loss.

He doubted whether there was a heavy loss on tramcars running on workmen's fares. If you take a tramcar running fairly full in normal times, it holds a good deal more than a motor omnibus to begin with, and he doubted if there is a serious loss. As to whether the time has come when omnibuses should give workmen's fares, he said that the difficulty is that you cannot compel anybody to run a motor omnibus. On the other hand, most municipalties are under statutory obligation to run a reasonable service of workmen's cars on their tramways. There is no compulsion on a municipality to run a tramway, but if the municipality has an authorised tramway service, it is under obligation to run a reasonable service of cars, including a reasonable service during certain times of cars at workmen's fares.

GREAT WESTERN RAILWAY—ROAD MOTORS.

Mr. Frank Potter, general manager of the Great Western Railway, gave the Committee a detailed account of the road transport motor service provided by his company. He said they probably had done more than any other company in providing road motor services. The number of passenger cars in use is 110. They have been mainly for the purpose of dealing with such traffic as is ordinarily conveyed by passenger train, but, in addition to passengers, passenger train luggage and parcels, light goods and mails are conveyed in a number of cases. The railway parcels and parcels traffic local to the districts traversed are carried mainly on the roofs of the vehicle bodies, which are capable of conveying a weight of approximately ½ ton. The North Eastern Company have in recent years established a small number (about six) of similar services.

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Road motor services were commenced by the Great Western Railway in the year 1903. He handed in a statement showing the whole of the services instituted by his company, including those still in existence and those which had to be discontinued owing to difficulties created by the war. The passenger road motor services of the company now being worked are 33 in number, and 17 others have been discontinued.

The majority of these services connect small towns and villages with the nearest railway station, the distances from the railway of the places served ranging from 3½ to 21 miles.

The routes over which the services are run may be classified substantially as under:—

(1) Routes operated (*a*) to develop a district, though owing to the geographical difficulties of the country the probabilities of a railway being constructed for the same purpose are remote; and (*b*) as a feeler to ascertain the possibilities of a light railway to feed isolated towns, the pleasure traffic incidental to such routes being a secondary rather than a primary factor.

(2) Routes operated primarily to serve places of holiday and tourist interest, which formerly were served either regularly or on an indefinite basis by private agencies.

In establishing services the governing idea was that facilities would be afforded to districts capable of development but remote from the railway or other reliable means of communication. Taking the Helston and the Lizard service as an illustration, its establishment has resulted in a large number of people visiting the district.

Many of the routes operated by the Great Western Company are virtually extensions of the railway, and in addition to such profits as may be earned it has to be remembered that there is a certain contributive value in the traffic brought to the railway which may be the factor justifying the introduction and continuance of such services.

He quoted statistics of passengers on various routes which showed that as between 1913 and 1918 there had in some cases been increases, but in others there had been decreases. He also gave particulars as to goods carried, showing that the receipts per mile were considerably above the working expenses. In regard to the possibility of developing agriculture by means of road motor goods services, he gave a case from Worcestershire in which the service was worked at a loss and was discontinued. The North Eastern Railway Company had a similar experience in connection with two services in the Northallerton and Brandsby districts. Both of these services were withdrawn since the outbreak of war.

It has to be borne in mind that when these services were instituted road vehicles were not as efficient as they are to-day, and it is conceivable that different results might follow the establishment of similar services to-day with modern vehicles in suitable districts, always provided that local agriculturists are prepared to co-operate with each other and with the railway companies.

The Great Western Railway Company have of late years introduced road motor vehicles for parcel cartage at the principal centres of their system. Three types are in use, namely, 3-ton, 1½, and 1-ton vehicles, the total number running up to 79. The cost per mile were respectively 6·32d., 4·46d., and 4·97d. In the second case the majority of the vehicles were new. As compared with horse vehicles the advantages of the motor parcel van were quicker delivery, extension of area, and ability to deal with abnormal traffic. Eighteen additional parcel vehicles are now on order.

Forty vehicles are engaged on goods collection and delivery, worked at certain large centres. They include steam tractors, petrol tractors, 5-ton lorries, 3-ton lorries, 1½-ton lorries, and, besides, four 5-ton electric lorries and eleven 3-ton steam lorries are on order. The following were some working costs per ton:—Steam tractors, 14·8d.; 5-ton lorries, 23·93d.; 3-ton lorries, 32·67d.; 1½-ton lorries, 42·1d.

The improvement and development of the motor industry has been very fast, and just before the war he was getting much more useful types of vehicle than were available a year or two before.

In regard to the agricultural traffic, a good deal could be done if there was more co-operation between the farmers. The thing, however, that the railway company could not get over was that there was no response by co-operation on the part of the farmers to the provision of facilities. The attempt to get direct supplies from the country to the consumers has not worked out well.

ROAD MAINTENANCE.

The railway company do not have to make any arrangements with regard to contributing to the cost of the up-keep of roads in the district where they run their heavy motors. There is no legal right, he said, to exact any contribution. In connection with the development of their traffic on the Lizard Peninsula, the company were confronted with the allegation that their motor omnibuses were responsible for the increased wear and tear of the roads, and they were asked to pay for it. They replied that they were not prepared to pay for it, and that if the local authorities did not want the district developed, and did not want to respond to this enterprize, the company would take the cars away.

As part of the common user of a road the company should pay their proportion for the damage that they caused to the road, provided that everybody else who damaged the road paid his proportion. The company had taken up the position that their wear and tear of the road was not so much as that of many other vehicles. He agreed that if the tramway has to pay because it lays down its track, other people who use the road should also make a corresponding payment, but he also had to say that the tramway companies do not have to buy the freehold of the road, and if they keep the track up for their own purposes that is all they were required to do.

Mr. I. T. Williams, acting general manager and chief goods manager of the London and North Western Railway, gave the opinion that there is a tendency to develop road motor traffic in preference to canal traffic. That is particularly so in Lancashire, say, between Manchester and Liverpool, to the extent of even 100 motor vehicles, and by arrangement getting them loaded in both directions, which is often that which cannot be obtained in the case of canal traffic. In reference to the use of motor vehicles for railway purposes in London, there is no use of having the motor in the narrow streets of the city of London, where one can scarcely get a horse vehicle through. His company used motor vehicles for long-distance traffic in the north of England because they can get something out of them there.

ROAD TRANSPORT BOARD VIEW.

Sir Evan Jones, chairman of the Road Transport Board, said that that body was constituted purely to deal with special questions of transport during the war. He gave an account of its organisation and of the work which it had done, mentioning that its primary object was to obtain the utmost efficiency out of the existing means available so as to provide for the necessary road transport of food, fuel, and munitions, while at the same time obtaining adequate facilities for the needs of the essential trades and industry of the country. In regard to the possibility of the development of road transport after the war, he said that there is no doubt that the combines arranged by the Board are working to the advantage of traders and owners of transport concerned, and it is probable that if their control by the Board is withdrawn after the war the schemes will to some extent be continued on a voluntary basis. He mentioned especially in this connection the continuance on a voluntary basis of the Return Loads Bureaux, which were set up by the Board. It is necessary to guard against these bureaux developing into instruments of competition with canals, railways, or common carriers. The functions of the bureaux can be extended with a view to arranging exchanges and co-ordinating transport between individual firms and also for supplying emergency transport. He, however, could not conceive the possibility of the development of road transport of goods on independent through service so long as railway or water carriage is available. Neither can motor transport compete in restricted areas with horse transport. The future of commercial road transport is, he thought, restricted to its use as independent local service in areas of a fairly extended character and deficient in railway facilities for the internal traffic of the area itself, and as an auxiliary and feeder service to the railways and canals for extra area traffic. A system of light railways fed by horse transport would prove a powerful competitor.

Local conditions would largely determine the relative adaptability of light railways or of motor services for any particular area, but the need for better transport facilities in rural districts is urgent and immediate, and there are great opportunities for motor road transport to prove its utility in this direction. Before any considerable development could, however, take place, there is much to be done in the provision of a proper system of local roads, without which motor transport will be severely handicapped.

The policy inaugurated by the North Eastern, Great Eastern and other railway companies in running motor omnibus services in connection with trains should be still further developed. Special vehicles to carry both passengers and light farm produce, such as fruit, eggs, etc., could be designed. The existing Road Transport Area Offices could be retained and made the centre of road transport business in every town. All motor haulage contractors and horse carriers should be registered with the office, and questions of rates and other problems might be settled with each local officer.

DEVELOPING AREAS.

One of the first things to be considered in connection with reconstruction is the linking up of newly developed areas and areas still to be developed. Agriculture and home-grown timber propositions, including afforestation, coupled with the development of new areas,

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open up possibilities for the extended use of road transport after the war. Where good roads are in existence from railways and towns to newly developed areas, the development of such areas would at first largely depend upon the establishment of motor services to link them up with the railways.

The conditions which will obtain for some time after the war may render some form of Government assistance for road transport imperative.

The repair and making of new roads, and the building of houses will for some time create a great demand for road transport, and if houses are to be built away from towns with the idea of healthier surroundings; then, later, additional transport facilities, both goods and passenger, will be required to feed and maintain new districts until they are linked up by the railways.

With regard to the further development of road transport, other than by means of self-contained schemes in suitable areas which can be worked independently, apart from the continuation of useful schemes for united working arranged during the war, it seems obvious that road transport must be regarded as an integral and effective portion of the whole transport organisation of the country, and not as an isolated enterprise.

STANDARD VEHICLE WANTED.

The special sphere of road transport will be in local distribution and as a feeder accessory to trunk systems. To fulfil this object it must be cheap. The petrol-driven motor, as we know it to-day, is not economical either in first cost or in running cost. As a preliminary to any well-devised schemes for cheap road transport, there must be evolved a standardised type of motor vehicle, with its spare parts all standardised also, and with all nuts, bolts, and screws of standard threads and sizes.

If road transport is ever to become successful and to develop materially, it will never do so with the costly type of vehicle on the road to-day. You will never get any really good return until you have got some form of standardised vehicle which you can afford to run to death—that is practically what it means. It must be something which can be so very cheaply got that its maintenance is a secondary consideration.

The question of the eventual control and co-ordination of road transport depends on the measures decided upon for railway and other forms of transport. The development of road transport, as a main independent or trunk service, is unlikely to meet with any large measure of success. Any measure of control of road transport as an auxiliary and feeder service to the railways or canals must be regarded as a part of the whole, and be associated with the control of other forms of transport. As a separate service, the future development of road transport will be largely confined to self-contained areas where no other adequate transport facilities are available, and the retention of the Road Transport Board organisation in some modified form would be of considerable assistance in this connection in the co-ordination of services, and their adaptation to the general development of particular areas.

Sir Woodman Burbridge, managing director of Harrod's Stores, gave evidence as to his wide experience of the collection and delivery of goods in London. In regard to electrical vehicles, he said that he considered that electricity might be used in connection with this firm's road vehicles provided that the electricity could be obtained at a cheap rate. His firm use electric motors now very considerably. They have over 80, and for town deliveries nothing but electric motor vehicles. One advantage over the oil motor is that it is very much cheaper whenever there is much stopping and starting to do. His firm ran their electric motors at 1½d. per mile, where petrol motors at present cost them over 3d. The repairs of electric motors are very much less than those of petrol motors. The running cost of the electric motor now, as compared with the time before the war, was only about ¼d. per mile more for the extra cost of coal.

NATIONAL STOCK OF PETROL.

On February 24 the Government had in stock in Great Britain and Ireland 20,000,000 gallons of petrol, which the Petrol Control Department had imported. This quantity has since been available for sale. In addition the Government hold a large stock of aviation and motor transport fuel. Since the Government ceased to be the sole importers stocks have been accumulated by private importers.

Great Demand for Cars.—Although the dearness of materials has led to the price of many high-grade motor cars being increased by more than 60 per cent., manufacturers state that the demand for new cars is greater than they have ever known before.

L.C.C. AND MOTOR OMNIBUSES.

Powers to Run Auxiliary Services to be Sought.

The London County Council, on February 18, decided to apply for Parliamentary powers to run auxiliary omnibus services In reporting upon the proposals of the Highways Committee (particulars of which were given in our issue of February 13), the Finance Committee stated that if the estimates submitted to them by the Highways Committee were realised, the Council would not be involved in any financial loss upon the running of the omnibuses, without taking into account any increase of revenue which may accrue from induced traffic on the tramways.

Road Tax Proposal Withdrawn.

The proposal that the Council should contribute on the basis of ⅜ths of a penny an omnibus mile to the road authorities, the Finance Committee remarked, raised a difficult question of principle. They understood that it might be modified in certain directions by the Highways Committee.

In the discussion on the proposed contribution to the road authorities, Mr. H. H. Gordon objected to the suggested charge of ⅜d. per omnibus mile on the ground that anything that made traffic dearer was prejudicial to the community. If the proposal was agreed to, there was no justification for not also taxing any vehicle using the road.

Dr. Scott Lidgett said that the scheme was sound, but there should be no tax on locomotion. If a tax was imposed it must be equitable and fall on all kinds of traffic in proportion to the injury to the highways.

When the debate was resumed on March 4, Mr. H. H. Gordon had given notice to move the reference back of the report having regard to the undesirability of imposing taxation on traffic. This, however, was not moved, as Mr. Hume withdrew the following recommendation :—

"To provide that from the revenues of the omnibus undertaking contribution be made at the rate of three-eighths of a penny per omnibus mile towards the cost of road maintenance, such contribution to accrue in moieties to the road authority and tramway authority in respect of mileage run in thoroughfares along which tramways are in operation."

Thereupon the recommendation to apply for statutory power was agreed to by the necessary statutory majority without a division.

Austin Agricultural Tractor.—The Austin Motor Company, Limited, have produced a motor tractor for farm work which performs with ease tasks that would require four horses, such as a load of 4½ tons of grain. India-rubber grips are provided on the wheels for road traction, and on the land are replaced by spikes.

Triplex Safety Glass Wind Screens.—The new Enfield-Allday light cars are all fitted with Triplex safety glass wind screens before leaving the works. This protection for the safety of the driver and passengers, although adding slightly to the works cost, increases the value of the car, and it is interesting to note that the insurance companies have indicated their appreciation of this fact by lowering their premiums on road risks.

Lorries for Discharged Soldiers.—In reply to a question by Mr. Gwynne in the House of Commons, Mr. Kellaway stated that the Disposal Board of the Ministry of Munitions were prepared to supply War Department motor vehicles to discharged men who had been engaged in driving mechanical transport provided any approved organisation interested in their welfare was willing to undertake the responsibility of securing payment by instalments.

Austin Motor Company's £4,000,000 Orders.—Addressing a general meeting of the Austin Motor Company, Sir Herbert Austin stated that as a result of the company's organisation for post-war business they had orders for nearly £4,000,000 worth of cars, lorries, tractors, and lighting sets. These came from the most important firms at home, in the Dominions, and in foreign countries. When in full work the factory would form the largest and most complete automobile plant in the Empire.

Local Government Board and Mud Splashing.—In reply to a suggestion by Bradford City Council that steps should be taken to deal with the nuisance caused by the splashing of mud by motor vehicles, the Local Government Board state that the question was considered by a Parliamentary Committee, which reported that experiments had not yet resulted in the discovery of a splashguard which would be likely to prove sufficiently suitable to justify its general adoption. The Board might have added that defective road surfaces are the chief cause of splashing.

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DEVICE FOR AUTOMATICALLY INCREASING THE LEVERAGE ON BRAKES FOR HEAVY MOTOR VEHICLES.

By Henry Mozley.

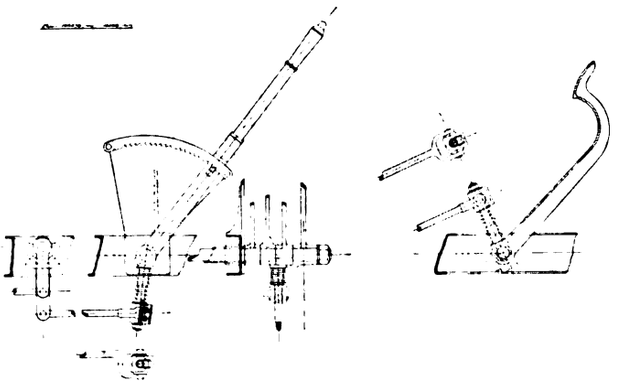
Heavy motor traffic, like tramway traffic, has had some sad experiences owing to brake failures, and whilst tramway brakes have had the attention of a committee of users, the employers of heavy motor vehicles have not published any data showing particular combined inquiry into the power of brakes or their improvement.

In view of the probable employment of motor omnibuses on heavy gradients in Burnley district, from personal observation of runaway heavy motors with fatal results, besides the frequency of similar accidents reported in the newspapers and technical journals of the motor industry, I came to the conclusion that the brake equipment was capable of improvement, and indeed must be improved to meet the requirements of a regular passenger service.

As an early member of the pioneer association (the Self-Propelled Traffic Association, Liverpool), I have never lost sight of the value of this form of transit and foresaw its present-day development, but I have had no opportunity as a user of going into the brake question till recently.

I now submit to your readers a practical invention which, I believe, will remove all danger from heavy motor traffic on steep gradients so far as brakes are concerned.

From a very long practical experience of tramway operation, I have had ample opportunity of coming to definite conclusions on



the question of brakes, and one of these is that the brake leverage (plus the pull by the driver) should exceed the gross weight of the car and maximum load. I think it will be found on investigation that this is not uniformly the case with heavy motors. To obtain an increase of leverage on existing brakes, with a minimum of alteration and expense, is the object of the device which is shown above, and I claim does accomplish this desirable and necessary object.

For the purpose of testing the device in service, I caused it to be applied to the hand brake on a Leyland motor overhead maintenance wagon, and its practicability and utility have been amply proved in months of service.

The device is designed to operate in either direction—modern practice requires the driver to pull the brake handle towards him, and this is the arrangement carried out on the Leyland chassis already referred to.

The following extract from the patent specifications will be sufficient to make clear how the device operates and its object:—"A brake mechanism having a lever with a projecting arm upon or in which slides a block or roller controlled by a spring or springs and connected to the brake, so as to keep the block or roller at the extremity of the arm or slot, and thus give the greatest travel at the commencement of the operation of the brake lever, preventing undue wear, taking up back lash developed by wear or want of adjustment. As the block or roller is pressed towards the fulcrum on the arm or slot by the operating lever, the power or leverage increases until it is at its greatest when the block or roller reaches the nearest point to the fulcrum, thereby giving a substantial increase in the brake power."

The whole operation is so simple that it is not necessary further to explain it, but I would advocate the use of the hand brake in regular service—always—and not occasionally and as supplementary to the pedal brake through the driving gears.

I believe the hand brake is gradually coming into use as the regular service brake, as I observed recently on the London General omnibuses. Whilst retaining the pedal brake as reserve, it will be found more advantageous, both as regards safety and economy of maintenance, to use the hand brake as the main brake.

I submit that a driver finding his hand brake ample in power, and easy to apply, will readily fall into the habit of using it for service. The device, as shown above, increases the leverage about 43 per cent., and seeing that this is accomplished without any alteration of brake mechanism, except the brake handle, users need not hesitate to apply the invention to existing vehicles.

LONDON OMNIBUS TRIALS.

Experiment in the Use of Duty-free Fuel.

Important announcements were made at a meeting of the National Benzole Association on February 26. Mr. D. M. Watson, chairman of this newly formed association of manufacturers, said that they had decided to be their own distributors, and with the goodwill of the motoring public he believed that they would pull through successfully. Benzole production was largely stimulated by the necessities of the war, the Government having given them a helping hand, with the result that they were in a strong position. At present the Government did not propose to impose an excise duty on benzole. The present output was 40 million gallons a year.

Mr. Shrapnel Smith, chairman of the Joint Committee for Mechanical Transport, claimed that the manufacture of benzole was a "key" industry, as was evidenced in those experiments in which benzole had been successfully mixed with both paraffin and alcohol. In this connection they would be interested to know that an experiment would be tried on a large scale on the streets of London within a few weeks, when 20 omnibuses would be run on that fuel.

Sir W. Keith Price said that it was now permissible for him to say that the whole of the Allies' explosive fuel programme had depended on the benzole and toluol produced in this country.

The National Benzole Association has fixed a standard of benzole for use as motor spirit. It will be water white in colour and free from acids, alkalis, and sulphuretted hydrogen, which causes a smell. The specific gravity is to be between ·870 and ·885.

MOTOR LEGISLATION COMMITTEE.

At a meeting of the recently formed Motor Legislation Committee, held at the Royal Automobile Club, under the presidency of Mr. Sidney Straker, Mr. Joynson-Hicks, M.P., stated that the Motor Legislation Committee at present consisted of the Automobile Association and the Society of Motor Manufacturers and Traders. They had decided that representation on the committee in future shall not be conditional upon subscription to its funds. In view of the important questions affecting road transport shortly to be brought before the House of Commons, he expressed the hope that all motor organisations would nominate representatives to serve on the Motor Legislation Committee.

The committee has opened offices at 83, Pall Mall, with Lieut.-Colonel Hacking, a solicitor, as general secretary, and Mr. A. Thomson as Parliamentary secretary. Mr. Joynson-Hicks is the chairman, and Mr. Rees Jeffreys deputy chairman. Among the objects of the committee are the following:—

Rapid removal of the war restrictions on the use of motor vehicles.

Restoration and strengthening of the roads and bridges.

Provision of a plentiful supply of motor fuel at reasonable rates.

The committee emphasise the fact that the recent railway strike demonstrated the extreme importance of road traffic, and that there is the possibility of large areas being dependent on its efficiency. Opposition is to be given to the Government scheme for placing roads under the control of the Minister of Ways and Communications.

In connection with the committee a Parliamentary Committee has been constituted of Members of Parliament, and at the time of the introduction of the Government Bill for setting up the Ministry nearly two hundred members had joined the committee.

In a statement issued on behalf of the Parliamentary Committee, it is remarked that they will seek to develop commercial transport in areas in which it is at present unprofitable.

Motor Coaches for Lancashire Tramways.—In their annual report the directors of the Lancashire United Tramways, Limited, state that they have decided to develop the motor transport business in conjunction with the tramways, and have placed orders for 25 motor coaches. It is hoped that the vehicles will be in service during the coming spring.

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SOLID RUBBER TIRES MILEAGE GUARANTEE.

To the Editor, "The Tramway and Railway World."

SIR,—The practice of guaranteeing a minimum mileage for solid rubber band tires was developed in the infancy of the commercial vehicle. Its chief purpose was to show that in spite of the apparently costly nature of the tires they were, nevertheless, both practical and economical in application. It has achieved that purpose so effectively that nobody in these days has any doubt as to the resultant ton-mile economy of the solid rubber band tire, and that its efficiency tends to become more marked as experience of the conditions of use becomes more readily available.

Even under present unfavourable conditions large numbers of tires consisently give more than guaranteed mileage, and when the conditions are reasonably good, mileages running up to three or four times the guarantee are nothing out of the common.

The perpetuation of the mileage guarantee, however, is attended by certain marked disadvantages In the minds of users it leads them to expect the guaranteed mileage and nothing more. It tends towards the production of a "stereotyped" tire just capable of fulfilling the guarantee and no more. It encourages carelessness on the part of the driver, who regards the responsibility for the tire as solely that of the maker. It is necessarily hedged about by technical conditions and stipulations, which, in some circumstances, are difficult to see properly observed.

The members of the British Rubber Tire Manufacturers' Association have now decided to abolish the standard mileage guarantee completely, together with its limitations and stipulations. They will for the future be content to allow their products to be judged by the service given (as distinct from merely guaranteed), and are making it their business to see that their tires give the biggest mileage, the best service, and fullest satisfaction to their customers.

Considerable assistance in regard to these points is expected from systematic collective research, and the British Rubber and Tire Manufacturers' Research Association, which is now in process of formation, has an extensive programme of enquiry before it on the general subject of increased tire efficiency.

Of course it must be obvious that tire results will always vary according to the conditions of running, and especially the roads, but the members of the B.R.T.M.A. will constantly aim to produce the best tires.

Users can be assured of prompt and generous treatment to anyone who experiences unsatisfactory results, as although tires will now be supplied without mileage guarantee, they will not be supplied without full responsibility being accepted.

Yours faithfully,

W. B. PEAT AND COMPANY,
General Secretaries.

HALIFAX CORPORATION OMNIBUSES.

The accounts of the Halifax Corporation motor omnibus service for the year ended March 31, 1918, show a deficiency of £476 15s. 6d., which comes out at 2·381d. per mile run. The total revenue was £2,613 3s. 9d., or 13·05d. per mile, whilst the expenses were £3,089 10s. 3d., or 15·431d. per mile.

Subjoined are the details of the expenses per omnibus mile:—

TRAFFIC EXPENSES.	
Wages	4·383
Cleaning omnibuses	·401
Licences	·063
Uniform and sundries	·230
GENERAL EXPENSES.	
Third party and other insurances	·565
Deputations and sundries	·094
Proportion of rent, rates, and management expenses	·499
GENERAL REPAIRS AND MAINTENANCE EXPENSES.	
Bodies	·501
Chassis, Gearing, etc.	·583
Ignition fittings	·040
Engine and water circulation	·587
Oiling and lubricating	·683
Lighting fittings	·120
Garage and various	·538
Tires	1·089
Gas containers and repairs	1·136
Petrol	3·414
Gas	·505

MOTOR VEHICLES FOR MUNICIPALITIES.

MIDHURST RURAL COUNCIL propose to purchase a 5-ton steam tractor.

LEEDS TRAMWAYS COMMITTEE have sold a 5-ton steam wagon for £400.

SHEFFIELD CORPORATION have purchased three military motor lorries for £700.

WHITBY COUNCIL are considering the purchase of a motor to draw the fire engines.

WESTHOUGHTON COUNCIL have discussed the question of obtaining a motor ambulance.

LEYTON COUNCIL have applied for sanction to borrow £3,000 to meet the cost of three motor fire engines.

TODMORDEN COUNCIL have received a gift of a motor ambulance, and have appointed a committee to select it.

NELSON CORPORATION have decided to purchase a petrol motor wagon for use in the Highways Department.

BURY FIRE BRIGADE COMMITTEE have recommended the purchase of a motor fire engine at the estimated cost of £1,300.

SALFORD CORPORATION are to seek Parliamentary powers to run motor omnibuses in connection with their tramways.

HESTON AND ISLEWORTH URBAN COUNCIL have under consideration the purchase of a number of steam motor wagons.

WARWICKSHIRE COUNTY COUNCIL have decided to purchase ten steam motor wagons and trailers fitted with rubber tires.

LEEDS HEALTH COMMITTEE have decided to purchase another motor ambulance for hospital purposes as soon as possible.

POOLE COUNCIL have called for a report on the advisability of purchasing motor vehicles for the surveyor's department.

WARRINGTON COUNCIL have under consideration the purchase of a number of motor lorries for use in the highways department.

ROTHERHAM RURAL COUNCIL contemplate purchasing a motor ambulance for the removal of cases of infection to the hospital.

PONTEFRACT COUNCIL are considering the purchase of a motor fire engine and inquiring whether neighbouring authorities will share the cost.

PLYMOUTH CORPORATION Mental Hospital Visiting Committee have asked the medical superintendent to report as to the purchase of a steam motor lorry.

BURTON ELECTRICITY COMMITTEE have arranged to purchase an electric tipping wagon from Messrs. Ransomes, Sims and Jeffries, of Ipswich, for £1,262.

SCARBOROUGH CORPORATION are purchasing an electric battery machine for use as a water sprinkler and other street uses, and a petrol-driven wagon for general haulage.

SHEFFIELD HEALTH COMMITTEE recommend acceptance of the tender of Edison Accumulators, Limited, for the supply of three 2-ton electric tipping wagons at £1,304 each.

LEEDS CORPORATION have arranged for a workshop in connection with the fire brigade for motor vehicle repairs and asked the city engineer to secure the necessary machinery and fittings.

LIVERPOOL CORPORATION TRAMWAYS COMMITTEE have decided to instal the Bywater hydraulic system of petrol storage at their garage. The capacity of the installation is 20,000 gallons.

LONDON COUNTY COUNCIL have recieved recommendations from a number of Borough Councils to consider the provision of motor omnibuses for the purpose of linking up the tramway services.

SALE OF GOVERNMENT VEHICLES.

The Ministry of Munitions has announced that all the Government motor vehicles which are being dispensed with are sold by tender or by public auction after wide advertisement, and sales are being conducted in various auction rooms. Cars and lorries are also being sold separately. The only exception is in the case of obsolete machines or those of pre-war enemy origin. Motors are being disposed of in all parts of the country, and the needs of rural areas in connection with urgent food transport are constantly receiving consideration.

The Surplus Government Property Disposal Board is being continued under the Ministry of Munitions. The property for disposal is to be classified under seventeen different heads, each of which will represent a separate branch under a controller. Mechanical transport is to be under the charge of Lieut.-Colonel C. V. Holbrook. Surplus Government property can only be bought through this organisation, and inquiries should be addressed to the Secretary, Disposal Board, Armament Buildings, Whitehall Place, London, S.W.1.

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MOTOR TRAFFIC

WAR MOTOR WORK OF THE G.W.R.

During the war the staff of the motor depot of the Great Western Railway Company at Slough have undertaken special work for the Government. In one direction the work took the form of repairing A.S.C. motor lorries and engines to the order of the Ministry of Munitions. The existing shops at Slough being somewhat small for coping with the overhauling of the large fleet of mechanical road vehicles now owned by the company, an existing open shed was converted into a four-bay chassis erecting shop, with high doors of the roller-curtain type. The shop is lighted overhead by gas, with the lower lamps and flexible leads electric.

Various types of British and U.S.A.-made chassis and engines were thus overhauled during the war, including a number of 5-ton Berna vehicles. Ten of these Berna chassis were overhauled at Slough and then sent to Swindon to have G.W.R. chars-a-banc type bodies fitted, the vehicles being eventually used for the conveyance of munition workers in various parts of the country.

In addition to heavy chassis of such makes as Pagefield, Maudslay, Berna, and Kelly, a set of light Sunbeam chassis were put through the Slough shops in 1917, being then utilised by the Ministry of Munitions for conveying officials about London, they being handled, the *G.W.R. Magazine* believes, by lady drivers.

Owing to the recruiting from the motor car department being over 50 per cent. of the total pre-war staff, the Slough shops could not have coped with this additional war work and at the same time maintained the company's road motor vehicles, had it not been for the considerable assistance rendered in connection with the latter work by the department's out-station staff at the twenty-nine road motor depots. These depots have contributed largely to the overhauling of their own spare service cars, in addition to their regular work of doing running repairs only, and thus relieved the Slough shops to a sufficient extent to allow of the Government work being consistently carried on.

The company gave permission to Mr. G. V. O. Bulkeley to act as consulting engineer to a committee of the Fisheries Board, which has been dealing with the augmented engining of fishing vessels during the war. A large number of vessels were engined, and individual propellers designed for each, so as to obtain the best propulsive efficiency when towing trawls.

Last year a preliminary drawing and specification were prepared at Slough for the design of a special type of heavy marine paraffin engine, suitable for powering fishery vessels in two, three, and four cylinder sets for single and twin screw installations. This design has now been fully developed and built to by a prominent firm of engineers in the Midlands. The engine develops ten brake horse-power per cylinder at 450 revolutions, and follows in several respects the successful marine internal combustion engine practice of the Pacific Coast of North America, where all the salmon craft, up to several hundred tons displacement, have large oil engines.

NAPIER LORRIES IN FLANDERS.

The accompanying photograph of Napier lorries taken in Flanders gives a realistic impression of the condition of the country behind the fighting lines. As will be seen, a portion of the road had been entirely destroyed by shell fire, and a temporary by-pass has been made around the crater. The bleak aspect of the countryside is typical, and the character of the runs which the motor lorries had to make is vividly portrayed. The construction of the temporary road is illustrative of some of the minor difficulties with which the labour battalions under the supervision of the Royal Engineers had to cope. It is interesting to note that one Napier lorry which was in the retreat from Mons is still running, and has received official sanction to be christened "Charley's Aunt," the name which the driver has proudly painted on both sides of the bonnet.

ELECTRIC STARTERS FOR CARS.

It is no new or untried device which Messrs. C. A. Vandervell and Company are able to place before the public now that the approach of peace has enabled them to turn their energies from production for war purposes only. In the C.A.V. new electric starter motorists have a reliable instrument that operates with both ease and effectiveness. Its history goes back to 1917, and its triumphs have been scored on air machines as well as on every type of internal combustion engine running on the road. With so convenient an appliance, one can hardly imagine a car owner any longer taking the risk of a broken wrist, or permitting his servant to do so.

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MOTOR TRAFFIC

MOTOR TRAFFIC NOTES.

OMNIBUSES IN SYDNEY.—The traffic authority has lately been directed to issue licences for motor omnibuses wherever the conditions of the traffic permit. On various suburban routes over 20 single deck vehicles are running.

DAMAGES FOR MUD SPLASHING.—The sum of one guinea was awarded to a plaintiff at Wells County Court on February 18 for damage to her dress by mud splashed by a motor car. The allegation was that the car was driven negligently and furiously.

GLASGOW'S MOTOR EXAMINER.—The Corporation have appointed Mr. D. C. Maclachlan, of the Glasgow Automobile Company, as official examiner of motor cabs and drivers at a fee of £25 for each annual inspection of cabs and 2s. 6d. for each driver examined.

CAR'S SPEED WITH AEROPLANE ENGINE.—On February 17 a car fitted with a twin six-cylinder aeroplane engine, at Daytona, Florida, traversed five miles in 2 min. 34 sec., ten miles in 4 min. 9 sec., and 20 miles in 9 min. 21 sec. These times break three world's records.

GLASGOW MOTOR EXHIBITION.—Rennie Motors, Limited, have offered Glasgow Corporation a rent of £1,000 for the use of the exhibition building for two or three weeks in January, 1920, for the purpose of holding a motor exhibition. A committee of the Corporation recommends acceptance of the offer.

TRANSPORT COMMITTEE AT HUDDERSFIELD.—A Transport Committee has been appointed by Huddersfield Town Council, with Councillor Hoyle as chairman, and Councillor W. H. Sutcliffe as vice-chairman. A sub-committee has been appointed to ascertain exactly the transport requirements of each department of the Corporation.

TRANSPORT DISCUSSION AT NORWICH.—The eastern divisional officer of the Road Transport Board recently held an informal inquiry at Norwich in order to obtain the views of those interested in the question of rural transport facilities in the districts between Norwich and London. Suggestions were put forward for both light railways and road motor vehicles.

PRICE OF MUNICIPAL MOTOR FUEL.—The gas works of Leeds Corporation produce between two and three hundred gallons of benzol per day, and under the direction of the Benzol Manufacturers' Association the selling price is half a crown per gallon. The local branch of the Motor Cyclists' Fuel Union contend that a fair price would be one shilling per gallon, and they have asked the Corporation to sell at from one shilling to eighteenpence.

CROYDON RELIEF ROAD PROJECT.—For three years before the war it had been planned to construct a by-pass road from Thornton Heath to Purley, thus giving to motor traffic an alternative route on two miles of the Brighton-London road through Croydon. Before the war Croydon Corporation estimated the cost at £88,643, but it is now put at £148,237. They have decided to proceed with the scheme, and the Road Board have increased their grant from £45,000 to £55,000.

TRUCK EXPORTS FROM U.S.A.—During November last the United States exported only 974 motor trucks as compared with 1,496 in the corresponding month of 1917. To the United Kingdom 32 vehicles were shipped, while France took 422. For the 11 months ended November last 9,412 vehicles were shipped as against 13,672 for the similar period of 1917. Although the war import tax was then in existence, the United Kingdom received 2,254, and France 2,986, while Canada took 1,499 and Cuba 507.

MOTOR MAIL SERVICE.—The war has been responsible for not only deferring the institution of many new road motor schemes for the transport of the mails, but in some instances it led to the temporary withdrawal of existing facilities owing to the need for petrol economy. Before long the Post Office authorities are likely to institute many new services. Consideration will doubtless be given to the question whether the existing plan of putting the work out to contract will be adhered to, or whether the department shall own and run the vehicles.

MOTOR COACH TOURS RESUMED.—A popular feature of the two summers of 1913 and 1914 were the motor coach tours arranged by Chapman & Sons, of Eastbourne. These are to be resumed on May 26, the programme of the arrangements being now available. Tours will be undertaken to Aberystwyth and North Wales, North Devon, and the Cornish Coast, Lands End and the Cornish Riviera, Scotland (Oban) and the English and Scotch lakes. Each trip will now start from the Grand Hotel, Charing Cross. The fares are inclusive of hotel accommodation, and considering the present increased cost of living the advances over the pre-war charges are not unreasonable.

MOTOR TRANSPORT DEMOBILISATION.—Lieut.-Col. Spender Clay, in the House of Commons, asked the Secretary of State for War at what date he expected to complete the demobilisation of all non-commissioned officers and men who enlisted in the Motor Transport before January 1, 1916, and have employment awaiting them officially approved. Captain Guest replied that it was not possible to say definitely when the demobilisation referred to would be completed, but it was hoped that those eligible for demobilisation under existing regulations would have been released by May 1, except in so far as they might be temporarily required for the military machinery of demobilisation.

TRANSPORTING THE WOUNDED IN LONDON.—The vehicular section of the London Ambulance Column, a voluntary organisation, disbanded on February 15, thus bringing to a close the excellent work they have accomplished in transporting the sick and wounded to the various hospitals from the ambulance trains arriving in London. These cases numbered over half a million, besides which the section carried in their motor ambulances 75 per cent. of the casualties sustained in the air raids. Mr. B. R. W. Crothers, deputy director of the ambulance column, states that the majority of the nurses and drivers were on continuous voluntary day and night duty, every day of the year, some since the outbreak of the war.

MUNICIPAL OMNIBUS PROPOSALS.

COVENTRY.—The City Council are considering a scheme for motor omnibuses to feed the tramways service.

WHITCHURCH.—The Urban Council are in communication with neighbouring authorities with the idea of developing motor omnibus services for country districts.

PLYMOUTH.—The Traffic Sub-Committee of the Plymouth Corporation Tramways Committee are preparing a report on the question of the extension of tramways and the running of motor omnibuses.

WEST HARTLEPOOL.—The Corporation are considering the desirability of seeking Parliamentary powers for the running of motor omnibuses in West Hartlepool and beyond the borough boundaries.

STOKE-ON-TRENT.—At a meeting of Stoke-on-Trent Council the Estates Committee reported that they had taken steps for obtaining Parliamentary powers to run motor omnibuses. The present omnibus service is regarded as inadequate.

BUXTON.—A scheme is before the Buxton Council for obtaining powers to run motor omnibuses to provide communication with outlying districts. The services would also prove valuable for conveying to and from the railway station the large number of Manchester business men who reside in the locality.

WALSALL.—Having had a deputation from the Pelsall District Miners' Association asking for more motor omnibuses to enable the men to reach work with greater convenience, Walsall Tramways Committee suggest an expenditure of £10,500 for the purchase of additional motor omnibuses.

MOTOR OPENINGS IN CANADA.

The *Board of Trade Journal* announces that a manufacturer's agent at Winnipeg wishes to be placed in touch with United Kingdom manufacturers of motor cars, accessories, tires, etc., with a view to acting as agent on a commission basis with exclusive rights for the territory from the Great Lakes to the coast (Western Canada). He estimates that Manitoba, Saskatchewan, Alberta, and British Columbia will absorb over £22,000,000 worth of automobile equipment and tires during the present year. Further particulars may be obtained from the Department of Overseas Trade, 73, Basinghall Street, London, E.C., and quote the reference number 150.

The construction of 10,000 miles of good roads as early as possible is one of the reconstruction proposals of the Canadian Government, the Dominion Treasury advancing 40 per cent. of the cost.

STRAKER-SQUIRE, LIMITED, PURCHASE A NATIONAL FACTORY.—For the sum of £140,000, Straker-Squire, Limited, have purchased the National Aircraft Engine Factory at Edmonton. The transaction gives the country a profit of £7,000 on the cost price. It is proposed by this well-known firm of manufacturers of private and commercial motor vehicles and municipal utility machines to transfer the whole of their activities to Edmonton. In the construction of cars they propose to concentrate upon two models. One will be a six-cylinder private car and the other a four-cylinder commercial chassis suitable also for omnibuses. The factory will be organised on lines of quantity production, and will employ 5,000 workpeople.

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SATURDAY, MARCH 15, 1919.

OBJECTIONS TO OMNIBUS SERVICES.

SOME new objections are being raised by the Horse Committee of Bournemouth Corporation to a project for running omnibuses between the town and rural localities. Subsidiary companies of the British Automobile Traction Co. are planning to link London with the South Coast from Margate to Weymouth, considerable areas already being traversed. It is desired to connect Bournemouth with the surrounding villages, beginning with two single-deck vehicles on each route; and to protect the tramways the promoters suggest fixing the charges at 50 per cent. in excess of the tramway fares. From experience in other towns the company state that this course has proved effective, and that relations with tramway authorities are most cordial, Reading and Maidstone being quoted as examples. In recommending refusal of the application, the Committee advance three points that seemingly have not figured in cases before the Courts. The reasons advanced for the recommendation are (*a*) Approval of the opinion of the borough engineer that the roads of the borough are not constructed and are not suitable for the additional traffic; (*b*) that the service would seriously and prejudicially affect the amenities of the town; (*c*) that it is unnecessary having regard to the facilities already provided by (1) the railway service, (2) the tramway service which will shortly be greatly improved, and (3) the service of motor chars-a-banc which the Corporation have recently decided to extend to the licensing of fifty cars. Impartially considered, only three of these contentions seem likely to cause much hesitation if the Council refuse the application and recourse is had to the law. The borough engineer dilated upon the impossibility at the present time of spending large sums on repairs or alterations to the highways which the normal use of the roads does not require. The force of this plea as regards the expense will decrease as time passes, but it may prove sufficient to give the Corporation the support of the Local Government (Emergency) Act, and it is not improbable that the uncertainty of road repairing costs decreasing within the next twelve months may lead to an extension of the Act at the request of local authorities. In no case that has been before the Courts has it been pleaded that an omnibus service would prejudicially affect the amenities of a town. The result has rather been to add to a town's prosperity by bringing in trade from outlying places. Bournemouth may claim that it is essentially a place to which invalids resort for quiet, but against this plea the argument could be advanced that the omnibuses will be running on few thoroughfares that are not already laid with tramways. Apparently the chief objection to omnibuses is based mainly upon the recent decision to extend the number of chars-a-banc licenses, which number is to be the maximum. Upon this point the applicants might urge what would appear to be a formidable argument, viz., that the chars-a-banc service is not to be likened to an omnibus service. Possibly matters might be made smoother for both sides if the authority promised to give the request favourable consideration in a year's time. In the meantime information might be gained as to the working of services in and around tramway centres and also as to the outlay on road preparation and maintenance. Observation in Kent will show that omnibuses are a great boon in the area enclosed by Chatham, Maidstone, Herne Bay, and Margate. With macadam roads which are evidently laid with something more binding than water, and with a good carpeting of tar, the effect upon the roads appeared to be no more destructive than horse vehicles.

NEW AND PROSPECTIVE WORK.

Pershore Council is considering the purchase of steam or petrol vehicles.

Derby Tramways Committee are obtaining six new cars, with the object of improving the service.

Halifax Tramway Committee have referred the question of purchase of a water tower wagon to a sub-committee.

Wigan Electricity Committee contemplate extensions to the plant at the electricity works at a cost of about £101,000.

Haslingden Tramways and Lighting Committee are to apply to the Local Government Board for a loan of £2,000 for extensions.

As mentioned in another column, Nottingham Corporation contemplate the expenditure of about £40,000 in the purchase of new tramway cars.

Wallasey Electricity Committee propose to ask for sanction to borrow £90,000 for the extension of the electricity station and for new mains.

Maidstone Town Council has adopted the recommendation of the Electricity Committee that a new high tension cable be laid to Tovil at an estimated cost of £2,102.

Leeds Watch Committee have accepted a tender of £450 for builder's work, in connection with the establishment of a workshop at the fire station for the repair of motor vehicles.

The Tramways and Electricity Committee of Halifax have been authorised to lay 1,000 yards of high-tension mains to Hebble Mills and to instal the necessary switchgear and transformer at an estimated cost of £905.

The Joint Tramways and Electricity Committee of Ashton-under-Lyne have approved the recommendation of the Generating Station Committee that an application be made to the Local Government Board for sanction of a loan amounting to £92,000 for electricity extensions.

The construction of a light railway from Torrington to Okehampton and thence to Moreton Hampstead is being discussed, and representatives of the local authorities concerned propose to appoint a deputation to wait upon Sir Eric Geddes in support of the scheme.

Worthing Corporation have agreed to an amended tender of £1,110 from Messrs. Ransome Sims & Jefferies, Ltd., for the supply of an electric vehicle. The quotation, in April, 1918, was £1,033, but the firm said the revised price was necessary because of the enormous rise in the price of material and wages.

Caistor Rural Council has under consideration a proposal for the construction of a light railway linking up several villages with the existing railway. The lines would be used for passenger and goods transport, including farm produce. Some of the villages are ten miles from any existing railway, and in pre-war days many small holders produced fruit and vegetables which there were no means of getting to market.

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TRANSPORT MINISTRY BILL.

The second reading of the Transport Bill is now fixed for Monday, and Sir Eric Geddes' statement explaining the object and scope of the bill is awaited with keen interest. The attitude which the Government will take was foreshadowed in a reply made by Sir Eric to a deputation of the docks and harbour authorities on Wednesday last. The impression left on the minds of the deputation was that the Government propose to stand or fall by the bill, and are unwilling to omit any section of it. Sir Eric laid stress on the interdependence of all forms of land transport considered from a national standpoint, and held out no hope that the dock and harbour undertakings, or presumably the roads, would be taken out of the bill. The deputation were urged to consider the matter from a national rather than from a local or sectional standpoint.

It is stated that members of Parliament connected with the British Commonwealth Union and the Federation of British Industries have decided to move the rejection of the bill on the second reading. Their main cause of hostility to the measure is the provision giving the Government power to act by Order in Council, and it is probable that the Government will not be unwilling to modify this arrangement, while adhering to the other principal provisions of the bill.

Replying to a question in the House of Commons on Wednesday, Mr. Bonar Law said that the local authorities, numbering two thousand, had not been individually consulted as to placing the control of the roads under the Transport Ministry, but the two Associations representing them had made certain suggestions. The Parliamentary Road Transport Committee, which it is said now comprises over three hundred members of Parliament has passed a resolution protesting against the roads being placed under the jurisdiction of a Minister who is also responsible for other methods of transport.

EMPLOYEES' DEMANDS.

Mr. Alfred Baker, general manager of Birmingham Corporation tramways, presided at a conference held at Manchester on Friday and Saturday, March 7 and 8, of representatives of the Municipal Tramways Conference, the Tramways and Light Railways Association, and the National Transport Workers' Federation. The conference was held in private, but it is understood that the demands of the employees for a 44-hour working week without reduction of pay and other concessions were further discussed. Representatives of the Associations had previously conferred with Sir David Shackleton, at the offices of the Ministry of Labour, and certain tentative proposals then put forward were further considered.

The conference closed on Saturday, having arrived at recommendations which it is hoped will lead to a settlement. The proceedings throughout were conducted in a friendly spirit, and the proposals will be submitted this week to separate meetings of the three bodies concerned. It is understood that very generous concessions, including a 48-hour week, have been recommended, although they modify to some extent the original demands of the employees.

THE SLOUGH MOTOR DEPOT.

Mr. Lovat Fraser has an interesting letter in the "Times" of Thursday on the Slough motor depot. The more the story of the depot is explored the more astonishing it becomes. The scale of the depot would suffice, says Mr. Fraser, for an army of many millions. The scheme includes, for instance, a tire store 635 ft. long by 374 ft. wide, giving a floor area of about five and a half acres for the storage of tires alone. Another building originally designed for storing American "spares" is 408 ft. long by 374 ft. wide. The lorry shelter is to be one-sixth of a mile in length, and the foundry is to measure 225 ft. by 300 ft. The War Office is running three special trains from London to Slough and back every day for carrying workmen, who are paid 22s. 6d. weekly in addition to the standard wage to compensate them for loss of time on the journey and for subsistence outside the London area.

In reply to a suggestion by Sir Arthur Fell that a committee of business members of the House should visit the works and report on the position of the undertaking generally, Mr. Churchill said that he saw no advantage at this stage of such an expedition. Sir James Stevenson, the new Surveyor General of Supply, had visited the depot and was preparing a report on the subject, which he expected would soon be ready and which would enable him to announce a definite policy to the House. Mr. Churchill added that the enterprise had been pushed forward as part of the war effort, and the question now was whether to wind up the undertaking or consider whether it could be given a place in our peace organisation.

Obstructive Standing Order.—The Parliamentary Committee of the London County Council, in reporting on the legislative proposals of the Highways Committee for the present session, suggests that in the event of the consent of the several road authorities not being obtained for tramway extensions, Parliament should be asked to suspend the standing order relating to this matter. The operation of this standing order (No. 22) has long been a difficulty in the way of tramway extensions. The repeal or revision of the order was recommended by the Royal Commission on London Traffic, 1905, and the recommendation was endorsed by the Select Committee on Motor Traffic, 1913. In view of the very exceptional circumstances at present prevailing, the Parliamentary Committee think that the Council would be justified in asking for the suspension of the standing order should such a course prove to be necessary.

ROAD BOARD OFFICERS.

Mr. Manville, in the House of Commons on Monday, asked the Prime Minister whether Sir George Gibb, previously general manager of the North Eastern Railway Company, has resigned the chairmanship of the Road Board in order to return to the service of that company, and whether it was the intention of the Government to appoint to the chairmanship of the Board someone who had practical knowledge of the problems of roads and road traffic. Mr. Baldwin, in reply, said that Sir George Gibb was continuing to act as chairman of the Road Board until a permanent arrangement could be decided upon as a result of the consideration by Parliament of the bill for the establishment of the Ministry of Ways and Communications.

It was stated in the House of Commons on Tuesday that Brigadier General Maybury, who has been acting as Director of Roads in France under the War Office, resumed his duties as engineer and secretary of the Road Board on February 27. Subject to the approval of the Board and of the Treasury where necessary, General Maybury has full authority to assist local authorities to carry out the programme of road and bridge work approved by the War Cabinet.

MISCELLANEOUS NEWS AND NOTES.

A Stoppage at Northampton.—Owing to engine trouble at Northampton Corporation power station, the tramway service was suspended during the afternoon of March 9 until the following day.

Arrangements for 48-hour Week.—The Dundee Tramways Committee on March 10 approved a re-arrangement of services to facilitate the scheme for a 48-hours working week for the employees.

All-night Service for Glasgow.—Glasgow Corporation Tramways Committee have practically decided to run an all-night service of cars as soon as the labour and materials necessary for increasing the number of available cars can be obtained.

Resumption of Railless Service at Rhondda.—The running of the railless cars of the Rhondda Tramways Company between Penygraig and Gilfach Goch will be resumed at Easter. The service was suspended during the war on account of the depletion of the staff.

Fine for Refusing to Leave a Car.—For refusing to quit a tramway car when requested to do so, two men were fined £1 each at the Bristol Police Court. When they boarded the car they were told that it was full, but refused to leave until the police were called. They were summoned for disorderly conduct.

Parcel Service at Glasgow.—It is reported that the experiment of a parcel service on Glasgow Corporation tramway cars, which was agreed upon for three months, has not proved satisfactory from the point of view of the amount of business done, and unless there is a substantial addition the scheme will be dropped about the end of the month.

Tarland-Aboyne Motor Service.—A motor service for goods and passengers between Tarland and the Howe of Cromar is projected. At a public meeting it was decided to ask the East of Scotland Public House Trust, Ltd., the present mail carriers, to commence a motor service. A committee was also appointed to take steps to secure a motor service between Aboyne and Tarland.

Municipal Engineers' Salaries.—The Institution of Municipal Engineers is giving earnest attention to the revision of the salaries of municipal engineers. Many individual cases have been dealt with, and at a recent meeting of the Institution it was reported that in one case, as a direct result of a communication from the Institution, the salary of the engineer was increased by £63 per annum.

Smoking While on Duty.—The London and Provincial Union of Licensed Vehicle Workers consider that tramway and omnibus drivers should be permitted to smoke while on duty, and they have communicated their views to the London County Council, the London General Omnibus Company and the Commissioner of Police. The Union is good enough to admit that the conductor could hardly collect fares inside a vehicle while smoking.

Parcel Service at Dundee.—It was announced at a recent meeting of the Dundee Corporation Tramways Committee that the Dundee, Broughty Ferry and District Tramways Company propose to discontinue the carrying of parcels on the cars. It was decided to confer with the company on this subject, as the Committee felt that while the parcel service did not pay, it was a great convenience to the public, and considered that the rates might be placed on a commercial basis.

Bristol Services.—Tramway services cannot be run on Sunday in Bristol until there is an extension of the coal allowance. Several of the suspended motor omnibus services have been restored, though as a whole the service has not yet reached the pre-war standard; but other services will be resumed as circumstances allow. The company propose to meet all demands for pleasure trips in the summer as far as they are able, but shortage of labour and materials is a serious handicap.

New Cars for Nottingham.—Nottingham Corporation Tramways Committee propose to place orders immediately for twenty-five new cars at a total estimated cost of about £40,000. These cars will be similar in type to the Nottingham Corporation standard car which was illustrated in our issue of September 12, 1918. Three years ago the Committee provisionally ordered a number of new equipments and car bodies to replace those which are worn out, and they hope to obtain delivery of these at an early date. At the present time seventeen cars are permanently disabled awaiting the installation of new equipments, and many others require extensive repairs.

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Petrol Supplies.—Mr. Bridgeman stated in the House of Commons on Wednesday that the trade stocks of motor spirits in the United Kingdom on January 1st last were 28 million gallons, and on Feb. 1st 24 million gallons, these figures showing a considerable increase as compared with the previous year. Some reduction in the price of motor spirit had been recently effected and the prices now fixed are maximum prices, and not, as was formerly the case, prices below which spirit could not be sold.

Withdrawal of Women Tramway Employees.—At a recent meeting of the Newcastle Tramways Committee, the general manager (Mr. E. Hatton) reported that many of the employees were resuming work on demobilisation, and as a consequence it would be necessary to dispense with the services of the women who had taken the men's places during the war. The Committee passed a resolution expressing appreciation of the manner in which the women had carried out their duties. About forty women in the temporary employ of the Aberdeen Corporation tramways have been replaced by former employees who have returned from their military service.

Tramway Advertising continued at Cardiff.—At the last meeting of the Cardiff City Council, Councillor A. J. Howell moved the rescinding of the resolution of the Electric Lighting and Tramway Committee that on the expiration of the existing agreement the advertising on the outside of tramway cars be discontinued. He urged that with the rates going up it was not reasonable to sacrifice the revenue to be derived from advertisements. The motion was seconded by Councillor T. Morgan and carried by 14 votes to 11.

Shortage of London Taxi-Cabs.—The Home Secretary, replying to a question in the House of Commons on Tuesday, said that the present shortage of taxi-cabs was due to the scarcity of material and labour. As material became available, more and more cabs would be overhauled and put in service, but the question of licensing other types approximately suitable was under consideration. Sir P. Goff, having observed that several French firms were ready and willing to supply vehicles at once as soon as the Government prohibition was lifted and the duty taken off, Mr. Shortt said it was a question whether such vehicles were fit for the traffic of the London streets.

The Channel Tunnel Assured.—Mr. Bonar Law, in reply to a question in the House of Commons on Monday with reference to the possibility of an early commencement of the construction of the Channel Tunnel, said that he was in communication with the Prime Minister in Paris on this subject. It was subsequently stated that the French and English Governments had agreed upon the construction of the tunnel, and that the main features of the plans have already been decided upon. There will be two tunnels, connected at intervals, and the trains will, of course, be electrically driven. It is anticipated that the work can be completed in six or seven years.

Omnibuses for Edinburgh.—In his report to Edinburgh Tramways Committee, recommending the electrification of the cable tramways, Mr. R. Stuart Pilcher, general manager, urged that "it was desirable for the city to obtain powers to operate motor omnibuses in conjunction with the tramway system outside the city boundaries. There will be a distinct scope and promising field for the operation of motor vehicles. In addition to the temporary services over proposed extensions of the tramways, motor omnibuses would be useful to supplement the existing services at certain points; they would also be useful in cases of breakdown of portions of the cable system and for special purposes."

Alton and Basingstoke Light Railway, which was one of the earliest promotions under the Light Railways Act, and was constructed by the London and South Western Railway Company, was pulled up during the war and the rails sent abroad. In reply to a question in the House of Commons on Tuesday whether the line would be reinstated, Mr. Bridgeman said that the President of the Board of Trade had been in communication with the railway company, and he understood that, although they had not yet arrived at a definite decision, they saw no prospect in existing circumstances of the railway being relaid and reopened for traffic in the near future. The general question of improved communication was one for the consideration of the Ministry of Ways and Communications when it was established, and in the meantime the President of the Board of Trade could not usefully take any action.

PERSONAL.

Councillor James Cavey has been appointed chairman of Wigan Corporation Tramways Committee.

Mr. Peter Fisher, general manager, Dundee Corporation tramways, has received an increase of salary to £700.

Mr. L. J. Kettle has been recommended by the Electricity Supply Committee of Dublin for appointment as city electrical engineer.

Sir Maurice Fitzmaurice, C.M.G., has resigned the chairmanship of the Canal Control Committee, and Mr. Sidney Preston was been appointed as his successor.

Mr. William Billington, assistant to the general manager of Salford Corporation Tramways, has been appointed general manager of Wigan Corporation tramways at a commencing salary of £450 a year, rising by two annual increments to £500.

Mr. Benjamin Hall, of Keighley, has been appointed rolling stock superintendent, works manager and engineer of Wigan Corporation tramways at a commencing salary of £250, rising to £300.

Mr. E. W. Cockerlyne has been appointed highways and tramways permanent way engineer of Leeds Corporation, in succession to Mr. R. B. Holt, who, as mentioned in a recent issue, has resigned that position in order to accept an appointment on the staff of Messrs, Sandberg, consulting engineers, of Westminster.

FINANCIAL.

Paisley District Tramways Co.—A dividend is announced at the rate of 5 per cent. per annum (5s. per share) on the preference shares for the half year, making 5 per cent. for the year. A sum of £16,000 is added to the general reserve, making £100,211, £5,000 to income tax reserve and £6,072 is carried forward.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Mar. 12 amounted to £69,962, an increase of £14,542 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to March 12 (forty-nine and a half weeks) the total receipts were £3,286,940, an increase of £567,384 on the corresponding period of 1918.

Underground Electric Railways Co.—Lord George Hamilton, presiding at the annual meeting of the Underground Electric Railways Company of London, Ltd., described the report as the best in the history of the company. Referring to the question of the suggested increase in fares, he said that sometimes the raising of fares operated in such a manner as to reduce the revenue. Alterations under the present conditions would require very grave consideration, otherwise the company might lose the goodwill of the public. The shorter working day now becoming general would add heavily to their working costs and further fare adjustments were now being made to meet them. The Associated Equipment Company had had a good year. During the war its business had so expanded that it was not likely to be wholly occupied in manufacturing for the Omnibus Company. Its future must depend largely upon the commercial development of the heavy petrol-driven vehicle. There was probably no enterprise more captivated by the idea of nationalisation than the Underground. Their railways were protected by statutory powers, but their omnibuses were open to competition and attack. The omnibuses carried nearly two-thirds of the passengers, and if there was any very heavy curtailment of traffic by outside competition the dividends of the Underground would be greatly diminished.

Reading Tramways.—Mr. G. F. Craven, general manager and engineer of Reading Corporation Tramways, in a report to the Tramways Committee, says that the receipts for the years 1905 to 1912 varied between £32,543 and £34,277, but from 1913 a very rapid increase took place, which promises this year to bring the receipts to £68,000. It is impossible to estimate even approximately the revenue for the next year, because it will largely depend on a decision in regard to fares and the prosperity of the borough. While variations in wages were slight up to 1915 since then the increase has been marked and in the present year may reach £35,000. Wages on all tramways must increase with the introduction of a shorter week. Next year more men will have to be employed in repairs to permanent way, rolling stock, and buildings. Taken altogether, the estimated wage increase of £42,000 for 1920 cannot be regarded as too high. The prices of the principal materials have increased from 200 to 300 per cent., since 1914, and quotations by manufacturers of tramway supplies continue to increase. The manager considers that the estimated cost of materials at £20,000 is quite moderate and not easily to be reduced, if the tramway equipment is to be maintained in good order. After adding to the foregoing figures capital charges of £11,732, there is a total charge against revenue of £73,730. The estimated financial result for the year ending March 31, 1920, is not very reassuring, for it shows that the expenditure may exceed the total revenue by £5,730 and points to the fact that every reasonable effort must be made to increase the revenue.

CONTRACTS AND ORDERS.

The Associated Equipment Company, Ltd., has received an additional order for thirty single deck omnibuses from Liverpool Corporation. Including the vehicles recently ordered by the Corporation from the same company, the new fleet now under construction consists of sixty single deck omnibuses.

The Woods-Gilbert Rail Remodelling Company, of 170, Strand, London, W.C., are about to begin the execution of a contract with the London United Tramways Company for the remodelling of the rails on certain sections.

Bradford Tramways Committee have placed contracts with Dick, Kerr and Company, Ltd., for 26 tramway cars with complete equipments, at £1,980 each, and for 52 traction motors, complete with controllers, resistances and circuit breakers, at £246 each.

THE
ENGLISH ELECTRIC COMPANY
LIMITED.

Abchurch Yard, Cannon Street, London, E.C.4.

This Company, with a Capital of £5,000,000, has been formed to consolidate under one direction and management the various interests of the following companies, in all of which a predominating control exists:—

COVENTRY ORDNANCE WORKS, LTD.
DICK, KERR & CO., LTD.
PHŒNIX DYNAMO MANUFACTURING CO., LTD
UNITED ELE TRIC CAR CO., LTD.
WILLANS & ROBINSON, LTD.

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PRICE LIST OF TRAMWAY AND OMNIBUS SHARES.

Dividends Prev.	Dividends Last.	Name.	Paid.	Price, July 27, 1914.	Cas Mar. 13 or previous.	A Week Ago.
5%	5%	Alabama Traction 5% 1st Mt. ..	—	67	68	69½
2/9	2/9	Anglo-Argentine 5½% 1st Pref.	5	4¾	67/6	71/3
2/9	2/9	Do. 5½% Cum. 2nd Pref. ..	5	4½	65/-	65/-
4%	4%	Do. 4% Deb.	100	91	67	67½
4½%	4½%	Do. 4½% Deb.	100	98½	69½	70½
5%	5%	Do. 5% Deb.	100	96	68	70
—	—	Associated Omnibus Co., Ord. ..	5/-	3/32	1/2	1/2
6d.	1/-	Auckland Elec. Trams. Ord. ..	1	1 5/32	19/3	19/-
5%	5%	Do. 5% 1st Mt. Deb. ..	100	102½	87½	87½
7%	7%	Barcelona Trac. 7% Pr. Lien ..	100	—	107½	107½
—	1/-	Bath Electric Trams Pref. Ord.	1	½	3/5	3/5
6d.	6d.	Do. 5% Cum. Pref. ..	1	3/16	10/-	10/-
4½%	4½%	Do. 4½% 1st. Mort. Deb. ..	100	72½	68½	67
4½%	4½%	Birmingham Dist. Pwr. and Tract. Co. 4½% 1st Deb. ..	100	84½	71½	71½
28/-*	14/-*	Bombay Elec. Sup. & Tram Ord.	10	14	23 1/16	23 1/16
6/-	6/-	Do. 6% Cum. Pref. ..	10	11½	10 11/16	10 11/16
4½%	4½%	Do. 4½% Deb.	100	96	76½	76½
5%	5%	Do. 5% 2nd Mt. Deb. ..	100	100	89	89
$1	$1	Brazilian Trac. & Power Ord. ..	$100	66	55½	53
$1½	$1½	Do. 6% Cum. Pref. ..	$100	97	91	90½
4/-	4/-	Brisbane Elec. Trams. Ord. ..	5	7½	5	5
2/6	2/6	Do. 5% Cum. Pref. ..	5	5	80/-	81/3
4½%	4½%	Do. 4½% 1st Deb. ..	100	101½	93½	94
3%	3%	Brit. Col. Elec. Ry. Def. Ord. ..	100	107	43½	41
6%	5%	Do. Pref. Ord.	100	106	42	43
5%	5%	Do. 5% Cum. Pref. ..	100	103	61	63½
4½%	4½%	Do. 4½% 1st Mt. Debs. ..	40	99½	85½	85½
4½%	4½%	Do. 4½% Perp. Con. Deb.	100	96½	62½	62
4½*	4½*	Brit. Elec. Trac. Ord.	100	—	47½	48½
6%	6%	Do. 6% Cum. Part. Pref.	100	—	79½	80
5%	5%	Do. 5% Deb.	100	92	84½	85½
4½%	4½%	Do. 4½% 2nd Deb. ..	100	77½	68½	68½
5%	5%	B. A. Lacroze 5% Mt. Deb. ..	100	100	74½	74½
5/6	2/6	Calcutta Tramways Ord. ..	5	7½	7 5/32	7
2/6	2/6	Do. 5% Cum. Pref. ..	5	5½	81/3	81/3
4½%	4½%	Do. 4½% 1st Deb. ..	100	99½	71½	71½
1/-*	1/-*	Cape Elec. Trams.	1	½	15/1½	15/1½
1/3	1/3	City of B. A. Trams	5	5½	81/3	81/3
4%	4%	Do. 4% Deb.	100	97½	71½	71½
5%	5%	Colombo Elec. Tram. & Ltg. Co. 5% 1st Mort. Deb.	100	95	80	80
5%	5%	Co. F.C. do. Jardin Botanico 5% 1st Mort. Bds.	100	93½	80½	80½
5%	5%	Costa Rica Elec. Lt. & Trac. Co. 5% 1st Deb.	—	63½	57½	57½
5/-	4/-	Dublin United Trams. Ord. ..	10	8	8½	8½
6%	6%	Do. 6% Pref.	100	—	105	105
—	—	Hastings & Dis. Elec. Tram Ord.	10/-	3/16	1/4	1/6½
1/2½*	1/2½*	Do. 6% Cum. Pref. ..	1	9/16	9/6	10/9
4½%	4½%	Do. 4½% Deb.	100	67½	60½	60½
8½d.	7d.	Hong Kong Tramway	5/-	9/16	23/6	23/6
5%	5%	Do. 5% Deb.	100	87½	98½	98½
1/6	3/-	Isle of Thanet 5% Pref. ..	5	2½	29/4½	29/4½
4%	4%	Do. 4% Deb.	100	73½	—	—
—	3%	Kalgoorlie Trams 6% B. Deb. ..	100	15	17½	14½
—	—	La Plata Trams. Ord.	1	½	2/6	2/6
9/6	7/-	Lanarkshire Trams Co. ..	10	10½	£10/9/3	£10/9/3
5%	5%	Lancs. Un. Trams 5% Pr. Ln.	100	85½	77	77
5%	5%	Lisbon Elec. Trams 5% Mt. Debs.	100	95	71	71
7½d.*	10½d.*	Llandudno & Colwyn B. Ord.	1	—	12/4½	12/4½
—	1½d.	London & Sub. Traction Ord. ..	1	13/32	3/3	3/3
6d.	6d.	Do. 5% Pref.	1	9/16	8/-	7/9
4½%	4½%	Do. 4½% 1 Mt. Deb. ..	100	75½	58	58
4½%	4½%	L.G.O. 4½% 1st Deb.	100	100	83½	83½
5%	5%	Do. 5% Inc. Deb... ..	100	88½	77	76
4%	4%	Lon. Unt. Trams. 4% 1st Mt. Db.	100	55	40½	41
3/-	3/-	Madras Elec. 6% Pref. ..	5	5 1/16	84/6	84/6
5%	5%	Do. 5% Deb.	100	100	86	86
7½d.%*	9½d.*	Manaos Trams & Ltg. Ord. ..	1	9/32	4/6	4/6
5%	5%	Do. 5% 1st Deb.	100	77	67½	67½
$1½	$1½	Manila Elec. R. R. & Light ..	$100	102	94½	93
4½%	4½%	Met. Elec. Trams. 4½% Deb. ..	100	85½	78½	73½
5%	5%	Do. 5% Deb.	100	87	77½	77½
$1½	$1½	Mexico Trams. Common ..	$100	70	45½	48½
5%	5%	Do. 1 Mt. 5% G.B. ..	—	84	61	62
—	—	Do. 6% Mt. Bds.	100	76	53	52½
4½%	4½%	Montreal Trys. Co. 4½% Stg. Dbs.	100	100	95½	95½
4½%	4½%	Do. 4½% Stg. Debs. (1922)	100	99	96	96
2/-	1/2½*	National Steam Car	1	15/32	16/9	16/10½
9½d.*	9½d.*	New General Traction	1	½	8/6	7/6
8½d.	6d.	Northern Gen. Trans. Ord. ..	1	7/32	14/1½	14/1½
4/-	3/-	Para Elec. Rlys. Ord.	5	4½	5 5/16	£6/7/3
5%	5%	Do. 5% 1st Deb.	100	89½	81	81
—	—	Pernambuco Tram. & Power Ord	1	—	7/9	7/9
—	8½d.	Do. 7% Non. Cm. Part Pf.	1	—	16/-	16/-
5%	5%	Portland Ry. 5% 1st Mt. 30 yr.	—	96	—	—
8½d.*	8½d.*	Potteries Elec. Trac. Ord. ..	1	11/32	10/-	9/10½
6d.	6d.	Do. 5% Pref.	1	13/32	11/6	11/-
8d.	1/4	Provincial Trams. Ord. ..	1	½	19/10½	17/7
3/-	3/-	Rangoon Tram. 6% Cum. Pref.	5	5½	82/6	82/6
5%	5%	Rhondda Trams. 5% 1 M. Deb.	100	88	79½	79½
5%	5%	Rio de Janeiro Try. & Pr. 1st Mt. 30 yr. 5% Gld. Bd. '35 ..	—	97½	93½	93
5%	5%	Do. 1st Mt. 5% 50 yr. ..	100	89½	81	81
5%	5%	Sao Paulo Deb. 5% 1st Mt. ..	$500	99	93½	93½
5%	5%	Do. 5% Perp. Deb. ..	100	99½	80½	80½
15/-	10/-	Shanghai Elec. Cons.	10	13	14 1/32	14 1/32
3d.	3d.	Singapore Elec. Trams. ..	5/-	½	5/-	5/-
4%	4%	Sou. Met. Elec. Tram & Ltg. 4% Db	100	66	54	54
5%	5%	S. Elec. Trams. of B.A. 5% Mt. ..	—	100½	99½	99½
4½%	4½%	Toronto 1st Mt. 4½% Bds. ..	100	98	94½	94½
4%	4½%	Tramways (M.E.T.) Omnibus 4½% Debs.	100	91	75	75
2/-	2/-	Un'd. El. Tr. Monte Video Ord.	5	4½	48/9	48/9
4%	4½%	Winnipeg El. 4½% Deb. ..	100	94½	69	69
—	—	Yorks (W.R.) Elec. Trams. Ord.	5	½	27/6	27/6
3/-	3/-	Do. 6% Cum. Pref. ..	5	½	83/9	83/9
4%	4½%	Do. 4½% 1st Deb.	100	85½	73	73
—	—	Metropolitan Dist. Ord. ..	100	21½	25½	24
—	—	Undgd. Elec. Rys. of London ..	10	21½	67/6	67/6
		Do. "A"	1/-	½	9/6	9/6
4½%	4½%	Do. 4½% Bds. of 1933 Rd.	—	99	103½	103½
6%	6%	Do. 6% 1st. Cum. In. Db.	100	114	103	101½
4%	4%	Do. 4% In. Bonds Rd. ..	—	88	94½	93

* Indicates dividend for the year. In other cases the dividend is for the half-year.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

Names.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C. ..	Mar. 1	434	502	+ 68	48	24,482	—
Aberdeen Corporation ..	Feb. 26	2,172	2,438	+ 266	39	101,104	+ 16,603
Ayr Corporation ..	Mar. 8	315	394	+ 79	42	23,620	+ 5,087
Birkenhead Corporation	" 9	1,885	2,167	+ 282	49	106,612	+ 15,757
Blackburn " ..	" 5	1,413	1,773	+ 360	49½	86,602	+ 13,528
Bradford Corporation .	" 8	7,003	9,369	+ 2,366	49	45 ,297	+ 79,678
Burnley Corporation .	" 8	1,995	2,629	+ 634	..	..	..
Burton-on-Trent Cor. .	" 9	366	402	+ 36	49	20,211	+ 4,201
Bury Corporation ..	" 9	1,666	2,105	+ 439	49	99,843	+ 19,450
Chatham & District ..	Feb. 27	1,179	1,237	+ 58	.	9,669	+ 189
Cork Electric	" 27	587	498	— 89	8	4,405	— 366
Derby Corporation ..	Mar. 8	1,209	1,434	+ 225	46	73,044	+ 13,131
Dundee City	" 5	1,547	1,997	+ 450	42	82,201	+ 16,354
East Ham Corporation ..	" 8	1,241	1,520	+ 279	48½	76,520	+ 3,964
Glasgow Corporation ..	" 8	26,794	27,916	+ 1,122	40½	1,145,896	+ 85,329
Glossop (U.E. Sup. Co.) ..	" 8	172	234	+ 62	10	2,107	+ 343
Halifax Corporation ..	" 4	2,125	2,748	+ 623	48½	135,905	+ 18,709
do. Motor Buses ..	" 4	51	72	+ 21	48½	3,246	+ 852
Huddersfield Corporation	" 8	3,103	3,541	+ 438	49	177,337	+ 22,182
Ilford U.D. Council ..	" 8	800	1,053	+ 253	49	49,181	+ 11,853
Ipswich Corporation ..	" 1	626	666	+ 40	48	35,625	+ 3,899
Isle of Thanet ..	" 8	167	325	+ 158	22½	6,064	+ 3,067
Kilmarnock Corporation	" 8	216	263	+ 47	42½	11,337	+ 2,530
Lanarkshire	Feb. 27	3,339	3,505	+ 166	8	30,318	+ 4,531
Leeds City	Mar. 8	10,929	14,061	+ 3,132	49	663,639	+ 125,041
Leicester Corporation ..	" 8	4,114	5,068	+ 954	..	..	..
Leyton U.D. Council ..	" 6	1,692	2,632	+ 940	49	116,642	+ 25,584
Liverpool Corporation ..	" 8	16,484	20,823	+ 4,339	9½	188,720	+ 30,93[illegible]
Llandudno & Colwyn Bay	" 7	242	292	+ 50	14	4,087	+ 825
London County Council ..	" 1	55,420	69,962	+ 14,542	49½	3,286,940	+ 567,384
Maidstone Corporation ..	" 6	226	281	+ 55	48½	13,814	+ 1,620
Manchester Corporation	" 8	23,041	26,953	+ 3,912	49	1,281,185	+ 240,243
Newcastle-on-Tyne Cor.	" 8	8,452	8,317	— 235	49	432,763	+ 44,487
Northampton Cor. ..	" 7	853	1103	+ 250	49	43,831	+ 2,245
Nottingham Corporation	" 6	4,650	6,406	+ 1,756	49	283,477	+ 62,728
Oldham Corporation ..	" 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation ..	" 6	1,068	1,351	+ 263	48½	63,278	+ 11,118
Rhondda Tramways ..	Feb. 28	1,609	2,103	+ 494	8	16,837	+ 4,121
Rotherham Corporation	Mar. 12	2,000	2,060	+ 60	49½	112,249	+ 20,878
Sheffield Corporation ..	" 9	13,008	15,528	+ 2,520	49½	659,502	+ 50,523
Southampton Cor. ..	" 5	2,209	2,421	+ 212	48½	121,508	+ 19,870
Southend-on-Sea Cor. ..	" 5	640	1,167	+ 527	49	63,228	+ 21,135
South Shields Cor. ..	Feb. 15	1,036	1,131	+ 95	46	52,960	+ 8,639
Sunderland Corporation..	Mar. 9	2,039	2,715	+ 676	49	109,344	+ 17,478
Swindon Corporation ..	" 5	268	291	+ 23	48½	14,817	+ 1,495
Torquay Tramways ..	Feb. 28	704	730	+ 26	8	5,772	+ 341
Tyneside Trys. & Trmrds.	" 19	857	755	— 102	8	5,780	— 81
Wallasey Corporation .	Mar. 8	1,437	1,992	+ 555	48½	91,979	+ 15,618
Walsall Corporation ..	Feb. 15	1,082	1,202	+ 120	49	57,053	+ 10,850
Walthamstow U.D. Coun.	Mar. 8	1,113	1,464	+ 351	49	70,110	+ 10,920
Warrington Corporation	Feb. 20	744	815	+ 71	47	36,572	+ 8,396
West Ham Corporation	Mar. 6	3,614	4,731	+ 1,117	48½	223,392	+ 45,472
Wigan Corporation .	Jan. 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

Name.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Mar. 4	£56,938	£58,381	9	£487,368	— £7,286
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Jan. 5	4,505	4,504	40	35,478	+ 2,167
Brazilian Traction (Mlrs.)	Dec.	8,069,000	8,531,000	52	101,894,000	+ 9,694,000
Brisbane	Feb.	32,009	34,380	8	72,955	+ 6,446
British Columbia .. $	Jan.	559,569	677,489	30	4,095,584	+ 612,355
Buenos Aires Lacroze ..	Feb.	34,397	42,429	34	343,209	+ 39,434
Burmah Tram. & Light Rs.	Jan.	25,430	38,265	26	214,804	+ 53,554
Calcutta .. .. Rs.	Mar. 1	74,605	88,622	8½	746,568	+ 118,557
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Feb.	2,031	2,351	8	6,006	— 2,036
Cordoba	Aug.	14,233	15,734	21	79,054	+ 8,740
East India	Feb.	1,318	1,689	30	13,612	+ 4,845
Hong Kong .. .. $	Feb. 4	12,246	12,854	1	12,854	+ 608
Kalgoorlie	Oct.	2,795	2,835	43	27,905	+ 982
La Plata	Feb.	4,746	5,698	8	11,428	+ 1,971
Lima	Dec.	43,198	47,887	52	527,839	+ 87,587
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Feb. 28	33,553	35,254	6	166,609	+ 17,415
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	+ 83,959
Manila .. .. $	Nov.	159,000	214,292	48	2,090,630	— 466,897
Montevideo	Feb.	34,573	38,772	17	149,821	+ 14,147
Para	Jan.	24,060	24,515	8	48,315	+ 940
Pernambuco	Mar. 6	4,347	5,421	9½	45,917	+ 3,941
Peruvian .. .. $	Feb.	925,410	943,470	34	7,973,835	— 229,195
Port Elizabeth	Nov.	3,807	3,198	...	..	..
Rangoon	Jan.	5,361	6,373	4	6,373	+ 1,012
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore .. .. $	Feb. 1	13,181	16,852	5	77,240	+ 15,663
Toronto .. .. $	Jan.	1,068,319	1,106,840	4	1,106,840	+ 38,521
Winnipeg .. .. $	Jan.	334,642	390,539	4	390,539	+ 55,897

WANTED.

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SATURDAY, MARCH 22, 1919.

MUNICIPAL TRAMWAYS IN AMERICA.

A remarkable change has taken place in the United States during the war in opinion concerning the municipalisation of tramways. Only a few years ago it would have been difficult to find any American interested in tramways who would not have scoffed at the idea that American Town Councils should own, much less operate, street railway undertakings. Visitors from this country who had studied the conditions of local government in the United States were inclined to agree that although municipal tramways in this country had proved successful, it would be an unwise experiment to place street railways in the larger American cities in the control of their municipal authorities. There has, however, been a considerable improvement in recent years in the character of municipal bodies in the United States, and the control of public utility undertakings is now supported by influential opinion, which has been encouraged by the progress of tramway municipalisation in this country. In at least two cases, Seattle and San Francisco, tramways have already been acquired by municipalities. Twelve or fifteen years ago in most of the States the street railway companies conducted their business with almost total freedom from supervision of local authorities, and there was little contact with the municipal authorities except when additional concessions were wanted. Now there is not only regulation of the service and of fares, but a check upon capitalisation and expenditure, so that little is left for the companies except the responsibility of earning interest on their investment. In these circumstances it is perhaps not surprising that many street railwaymen are declaring that the public should take over that responsibility too, because power and responsibility must go hand in hand if successful operation is to be maintained. Municipalities can, of course, borrow money for construction at lower rates than companies, and the public can obtain the service they desire, while as the community have to pay for this service, there is an efficient check on unprofitable and wasteful expenditure. In a recent discussion of the question, the *Electric Railway Journal*, of New York, hitherto an uncompromising opponent of municipalisation, expresses the opinion that it is possible to retain most of the advantages of both municipal and private enterprise, and get rid of most of the disadvantages of both through a partnership agreement between the municipalities and companies, and it hopes to see progress in this direction.

THE TRANSPORT BILL.

SECOND READING WITHOUT A DIVISION.

In the House of Commons on Monday, Sir Eric Geddes moved the second reading of the Ministry of Ways and Communications Bill in the House of Commons, and gave a very interesting and lucid account of the present position of the transport problem in this country, and of the objects which the Bill is intended to serve. He said that the condition which the country had to face was that the railways were being worked at a loss of something like £100,000,000 a year. For two years after the war the Government are obliged to continue the guarantee that the railway companies should receive net receipts equal to those of 1913. Apart from the railways other forms of transport had either been subsidised or had been given very large additional powers of charging, so that in one form or another all means of transportation, with the exception of tramways, had to come to the State for help. The canals and roads received grants and were run at the cost of the taxpayer. The roads cost the country £20,000,000 a year. The one bright exception in the statement was that of municipal tramways. There were 279 tramway undertakings in this country, of which 90 per cent. were electrified, and this showed that those undertakings were almost entirely modern. Taken over all, these undertakings were earning 7 per cent. on their capital, and they were excluded from the Bill. Before the war the return on railway capital was 4.3 per cent. The light railways were a comparatively small item; there were only 836 miles in all. Before the war they earned 2 per cent., but to-day they were working at a loss. All these undertakings ought to be got back on a paying basis. While it was admitted that the Bill was far reaching and that it gave great powers, the situation was so serious—although not desperate if it was tackled properly—that the Government thought the only way in which they could meet it was by the powers that were given in the Bill. He urged members to rise above the jealousy of roads, railways and local vested interests and to consider only the interests of the commonwealth.

The clause enabling the Government to nationalise the railways by Order in Council was withdrawn, and the powers of control are limited to two years. The debate was continued on Tuesday, when the second reading was passed without division. The proposal that the Bill should be considered in committee of the whole House was rejected by acclamation, and the measure will be considered by a Grand Committee. Considerable revision in detail will, no doubt, be made, but the principle of the measure seems to be assured. The text of the Bill as originally introduced was given in our issue of March 13.

L.C.C. TRAMWAY MATTERS.

The first meeting of the newly elected London County Council took place on Tuesday, when Lord Downham was elected Chairman. In returning thanks, the new Chairman said that in the thirty years of the Council's history that was only the third occasion on which the blue riband of local government had been conferred on an outsider, the previous cases being Lord Rosebery and Lord Crewe. The nation stood on the threshold of a new social era; but the new world would not come merely by Acts of Parliament, however wise. New and great changes would only come if local bodies settled themselves to the downright dreary drudgery of detail work. They were all for better housing, better means of transport, better uses of electricity and better education.

The following notice of motion stood on the agenda in the name of Dr. Scott Lidgett, the leader of the Progressive party :—

"That, in the opinion of the Council, the powers to be conferred on the Minister of Ways and Communications under the Ministry of Ways and Communications Bill are so wide, and the method of their exercise under Orders in Council so open to serious objection, inasmuch as they invade the rights of local authorities and increase the difficulties of the Council in organising a complete system of municipal transport for London, that the Bill should be opposed."

It was agreed to alter the motion to the form of a reference to the Highways Committee for consideration and report, and as such was adopted.

The Highways Committee submitted no recommendations in regard to tramways, but several routine reports were received. The usual statement as to legal proceedings showed that fines had been imposed for the following offences :—Obstructing cars (2 cases), assaults upon conductors (6 cases), on an inspector, avoiding payment of fares (5 cases), failing to produce a ticket or pay the fare (2 cases) spitting on cars (eleven cases).

Institution of Electrical Engineers.—Mr. J. S. Highfield will read a paper on "The Co-ordination of Research in Works and Laboratories," by the late Mr. H. R. Constantine, before the Institution of Electrical Engineers on Thursday, March 27, at 6 p.m. The meeting will be held at the Institution of Civil Engineers, Great George Street, Westminster, S.W.

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ROMNEY TO FAVERSHAM LIGHT RAILWAY.

A conference of the authorities interested in the proposed light railway from New Romney to Faversham, via Ashford, was held at Ashford on March 12. Mr. T. S. B. Moses, of the East Ashford Council, in outlining the scheme, said that it was proposed to construct a line of standard gauge similar to the Kent and East Sussex Light Railway. His Council would strongly oppose the alternative of motor traffic, owing to the present condition of the district roads, which were not at all suitable. It would be a different thing if the Government made trunk roads. The West Ashford and Romney delegates agreed that a light railway would greatly facilitate carriage in the district. It was not at all uncommon for journeys of 13 miles to be made by horse traffic. It was stated that the representatives of the National Farmers' Union had gone into the question of light railways versus motor transport, and the figures showed that light railways were out of the question, owing to the expense and the inflexibility of the scheme. Farmers were so scattered that the cartage to the railways would be too expensive. Light railway construction cost £2,500 per mile; the cost of motor transport was only about 1s. 3d. per mile, although this did not include the upkeep of the roads, which would have to be improved. The only way would be for the Government to take up the maintenance of the roads. They approved of the railway simply because of the condition of the roads, but they must have improved transport, as that would enable the district to get double and treble the traffic. Mr. Thomas said that the Government were anxious to meet the wishes of the public. It did not matter to them whether light railways or road transport was used.

NEW AND PROSPECTIVE WORK.

Burton-on-Trent Town Council intend to apply for a loan of £3,400 for the extension of the tramway depot. The estimates of the borough electrical engineer and tramways electrical engineer include building works, £2,500; overhead equipment and rails, £250; and purchase of property, £650.

Stockport Corporation propose to obtain quotations for ten top covered cars, and for fourteen top covers for existing cars. Quotations are also be to obtained for four double deck motor omnibuses.

Barrow Health Committee has decided to purchase two 3½-ton electric wagons at £1,252 each.

Dewsbury Electricity and Tramways Committee are submitting revised estimates for the proposed Dewsbury Moor and Shaw Cross tramways.

Kirkcaldy Tramways Committee propose to purchase a rail welding plant and motor generator at an estimated cost of £485.

A light railway is projected from Kimbolton to Peterborough.

MISCELLANEOUS NEWS AND NOTES.

The Road Board has ceased to grant loans to local authorities free of interest, as was done during the war.

Horse Killed by Falling Wire.—A falling trolley wire in Dudley struck a horse, which died from shock.

St. Helens Corporation have taken over the local tramways, and propose to purchase thirty-six cars from the company.

Sunderland Tramway Fares.—Sunderland Tramways Committee has recommended the Council to approve of penny stages in the new scale of fares.

Light Railway Order Confirmed.—The Board of Trade have recently confirmed the Hooton Light Railways Order, 1919, authorising the construction of light railways in the parishes of Little Sutton of Overpool and of Netherpool in the County of Chester.

Purchase of the Liverpool and Prescot Light Railway.—Subject to the approval of the Board of Trade and the Light Railway Commissioners, Prescot Council have decided to buy the undertaking of the Liverpool and Prescot Light Railway Company.

New L.C.C. Members.—Among the new members of the London County Council are a tramway driver and conductor. If either is appointed to the Highways Committee, the tramway men will have for the first time direct representation on that body.

British Association's Annual Meeting.—The annual meetings, which were suspended during the war, will be resumed this year at Bournemouth, and will continue from September 9 to 13, under the presidency of the Hon. Sir Charles Parsons.

Barrow Town Council is considering the purchase of the tramways, which are now owned by the Barrow-in-Furness Tramways Company. The Council has an option to purchase at the end of this month, but it will not recur again for seven years.

Trentham-Newcastle Light Railway.—The North Staffordshire Railway Company have informed the Board of Trade that although they are not as yet able to fix any date for the resumption of work on the Trent and Newcastle light railway, they hope to complete the undertaking.

48-Hour Week in Glasgow.—In the Glasgow Corporation tramway department the 48-hour week is now in operation at the works and depots, and it will soon be in force among the traffic staff. The change will entail a large addition in the number of employees and, of course, to the working expenses.

Auckland Electric Tramways.—The directors of the Auckland Electric Tramways, Ltd., have informed the shareholders that negotiations are in progress between the company and the Auckland (N.Z.) City Council with a view to the acquisition by the Municipality of the company's undertaking.

Ministry of Munitions Staff.—Since the date of the armistice the headquarters staff of the Ministry of Munitions has been reduced from 23,144 to 16,712, a reduction of 8,432 persons. Of these 2,541 were transferred to the re-settlement and demobilisation departments of the Ministry of Labour and 5,891 were discharged.

Women Conductors Displaced.—During the war 350 women have been employed as conductors on the Bradford Corporation tramways, but since demobilisation began 120 have given up their posts in order that the men who return from service may be reinstated. It is estimated that in about a month the remainder of the women will have retired.

Influenza Among Belfast Employees.—Mr. J. S. D. Moffat, general manager of the Belfast Corporation tramways, reported to the Tramways Committee this week that they were still severely handicapped owing to the large number of motormen and conductors laid up with influenza. The maximum number away at one time was 92, that number now being reduced to 62.

Automatic Indicators for Tramway Cars.—The fixing of automatic indicators in tramway cars was suggested by Coroner S. F. Butcher at an inquest at Bury on a woman passenger who fell off the platform of a car and was fatally injured. A passenger, in giving evidence, expressed the opinion that the woman, who wished to alight, thought the car had travelled further than it had done, and the coroner said that it would be an excellent thing if there were some automatic means in tramway cars to indicate the position of the car.

New Cars for Birmingham.—At a meeting of the Birmingham Tramways Committee on March 18, it was announced that an order had been placed for fifty new cars. The total number of cars in service is now 586, and several of the new cars will be replacements The Chairman, Councillor Lee, stated that considerable difficulty had been experienced in obtaining rolling stock, and it would be more than six months before any of the new cars could be delivered. Attention is being given to track renewals, but the dearth of material prevented much progress. There was, however, a prospect now of the release of more.

Extension of Wemyss Tramways.—At a meeting of the Northern District Committee of the Ayrshire County Council, Mr. Macdonald, the road surveyor, reported that he had received a letter from Mr. J. B. Brodie, of Glasgow, relating to schemes for providing additional transport facilities in North Ayrshire, including a tramway between Larges and Wemyss Bay, and a railway between Leith and the Glasgow and South Western Railway Station there. The Committee decided as regards the suggested tramway to advise Mr. Brodie that they would be prepared to consider any scheme he had in view.

Swansea Tramways.—At a meeting of the Swansea Corporation Tramways Committee, Mr. David James, manager of the Swansea Improvements and Tramways Company, who was present at the invitation of the Committee, said that the number of cars in use at Swansea before the war was 74, but at that time the cars carried fewer passengers per car mile than any other company. The number of cars was being increased and the mileage was being improved as a number of men returned from the front. The Committee decided to make certain new by-laws and to urge for further improvements in the service.

Wages Cost at Nottingham.—Mr. R. H. Swain, chairman of the Nottingham Tramways Committee, at a recent Council meeting, said that it was impossible for the penny fare to be again introduced The minimum fare might have to be raised even above 1½d., if the 44-hour week were granted to the employees. The cost of this would be £30,000 a year, while the 48-hour week would cost £17,800 a year, or, including several other provisions under discussion, £25,000 a year. The cost of the 48-hour week already promised would amount to more than the whole of the working expenses of the tramway department previous to the war.

Edinburgh Tramways.—Mr. R. S. Pilcher, the tramways manager, has been instructed by the Tramways Committee to make arrangements for organising an administrative staff, and an advertisement inviting applications for the position of traffic superintendent at a salary of £150 per annum, appears in this issue. Fifty additional top covers for existing cars are to be provided for use next winter. The deputation from the Tramways Committee that visited London recently to inspect the working of the conduit system appears to have been favourably impressed with the facility with which the cars pass from the conduit to the overhead sections. They consequently thought that the installation of the conduit system on Princes Street should be carefully considered. The report of the deputation will be discussed at a special meeting of the Tramway Committee.

New Omnibuses for London.—The design of the new omnibuses that the London General Omnibus Company hope soon to submit to the inspection of the licensing authorities has now been practically settled. Mr. G. J. Shave, chief engineer of the company, has described the vehicle as lighter, faster and larger than the present type. It will seat 40 to 45 passengers, instead of 34, and will have a normal speed of 15 miles per hour. The rear platform will be wide enough to permit a double stream of passengers leaving the vehicle, and thus reduce the time wasted at stopping places. Many of the parts have been lightened, and a faster running engine developing 35 h.-p. has replaced the heavier motor now in use. The tires will be more resilient, and riding, therefore, more comfortable. The upper deck will be extended over the engine. The sides of the body will be perfectly straight, giving more room in the interior although detracting somewhat from the external appearance.

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Straker-Squire New Factory.—Messrs. Straker-Squire, Ltd., have purchased the National Aircraft Engine Factory at Edmonton for £140,000, and will transfer their motor manufacturing business to it. They propose to concentrate upon two standard models, a six-cylinder type of fast pleasure car, and a four-cylinder commercial chassis suitable for transport work and motor omnibuses. The machines will be British built throughout, and will be fitted with British magnetos. The entire factory will be organised on the lines of quantity production, and it is anticipated that 5,000 people will be employed.

Inattention of Conductors.—Councillor D. Smith, of Gloucester, recently called attention to the persistent neglect of conductors to study the convenience of the public. He had heard many complaints of people being unable to get conductors to stop. Children had often to run long distances to catch a car because the conductor overlooked them. He himself had seen cars move off just too soon for people to enter. Drivers and conductors should understand that tramway cars were run for the convenience of the public, and not for the benefit of the conductors, who received wages for doing their work.

Institution of Automobile Engineers.—The ninth meeting of the Session of the Institution of Automobile Engineers will be held on Wednesday, April 2, at the Royal Society of Arts, John Street, Adelphi, W.C., at 8 p.m., when Mr. Carl Opperman will read a Paper on "Electric Vehicles." Cards of invitation to this meeting and the one mentioned below may be obtained by those interested in the subject on application to the Secretary of the Institution of Automobile Engineers, 28, Victoria Street, London, S.W.1. A further meeting will also be held at the Chamber of Commerce Hall, New Street, Birmingham, on the following day, viz., Thursday, April 3, at 7.30 p.m., when Capt. G. Smith-Clarke will read a paper entitled "Some Notes on Petrol Flowmeters and the Calibration of Carburettor Jets."

Present and Pre-War Costs of Tramway Construction.—At a meeting of the Wakefield City Council, it was reported that a conference had taken place between a sub-committee and Mr. H. England, general manager of the Yorkshire (West Riding) Electric Tramways, upon the question of a possible scheme of tramway or motor omnibus communication to Alberthorpe and Flanshaw. Mr. England had pointed out that the cost of tramway construction at present would be prohibitive. Rails, for instance, which before the war cost £6 12s. per ton now cost £17 10s. per ton, and only recently the Corporation of Sheffield had paid nearly £3,000 each for new tramway cars as against the pre-war cost of about £900. The cost of construction per single track mile was now estimted at from £8,000 to £10,000 as compared with £5,000 before the war. With regard to omnibuses, if the roads could be made suitable, the company would be prepared to run omnbuses at their own risk.

Electric Railways for Interurban Traffic.—It is impossible to exaggerate the interest which is now being taken all over the country in the question of transport. Sir Eric Geddes, who is to be the first Minister of Ways and Communications, in introducing the Transport Bill on Monday, said that he had got a small staff of technical experts who were assisting him, and he was being asked on all sides for advice about transport. It had been suggested that the great 60-centimetre Decauville organisation in France might be brought over here and with advantage spread like a network all over the country. He had been largely responsible for the Decauville railways in France, and they had filled their purpose, but the maintenance and cost of the Decauville track was very heavy and to put it down in this country for agricultural purposes would be simple throwing away money. He did not say there was no place in which it could be used effectively, but it was no panacea for all the evils in the agricultural districts. He thought, however, that there was a possibility of developing light electric railways for interurban traffic.

FINANCIAL.

East Ham Tramways Deficit.—It is estimated that the deficit on the East Ham Corporation tramways for the year ended March 31 will be equivalent to a rate of 6¼d. in the £, as the deficit will amount to £13,980. The estimated deficit on the electricity undertaking is £8,860.

British Insulated and Helsby Cables, Ltd.—A dividend at the rate of 8¾ per cent. has been declared for the past half year, making 12½ per cent. for the year on their revised capital. A sum of £80,000 is carried to reserve and depreciation, and £99,000 is carried forward. Last year the dividend was 7½ per cent. with a bonus of 10 per cent. making 25 per cent. for the year on the old capital.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Mar. 19 amounted to £70,874, an increase of £16,089 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to March 19 (fifty and a half weeks) the total receipts were £3,357,824, an increase of £583,483 on the corresponding period of 1918.

Wemyss and District Tramways Co., Ltd.—The report for the year ended December 31, 1918, shows that the profit amounted to £7,530, and with the sum of £828 brought forward there is an available balance of £8,558. After paying interest on mortgage debenture stock, £1,583, and placing £200 to the fund for the redemption of stock, a dividend at the rate of 6 per cent. on the preference shares and a final dividend at the rate of 6 per cent. on the ordinary shares is recommended. £3,000 is transferred to general reserve and £1,045 carried forward. The traffic receipts for the year amounted to £22,021.

Para Electric Railways and Lighting Co.—Presiding at the annual meeting on Monday, Mr. Follett Holt, the chairman, said that the earnings for the past year had been adversely affected by the economic depression and the disturbances of the last year of the war, while a violent epidemic of influenza had paralysed all the public services. Operating expenses had further increased, owing to trade restrictions and higher wages. As a result the balance carried to profit and loss, after allowing for exchange differences, had decreased by £8,782, or about 7 per cent. The directors, however, felt no anxiety at the decrease and it did not indicate a standstill in the development of the business. With their liberal allocation to renewals and reserve, it was a satisfaction to the board to recommend the maintenance of a dividend of 7 per cent.

PERSONAL.

A peerage has been conferred on **Sir George Askwith,** who has relinquished the office of Chief Industrial Commissioner, which he held since 1911.

Major Harry Richardson, R.E., general manager of the Dundee Corporation electricity department, who has been on active service since June, 1915, has resumed his duties on demobilisation.

Mr. J. H. Shaw, deputy electrical engineer of Bradford Corporation, has resigned his appointment and will become the representative of the Davenport Engineering Company, Messrs. Hick, Hargreaves and Company, and J. Shaw, Son and Greenhalgh, with offices at Temple Chambers, Temple Avenue, London, E.C.

Mr. Robert M'Creary, who is at present serving as a major in the Royal Engineers, has been appointed assistant permanent way engineer on the Belfast Corporation tramways. Major M'Creary is a native of Belfast, and was educated at the Royal Academic Institute, taking his degree at Queen's University.

Mr. Alexander Johnston, general manager of the North British Rubber Company, has joined the board as managing director. Mr. Johnston has filled all the principal official positions of the company during the last fourteen years, having been secretary and works manager before becoming manager.

Sir Eric Geddes, Minister of Ways and Communications, Mr. W. Long, M.P., in his capacity as Minister in Charge of H.M. Petroleum Executive, and Mr. Joynson Hicks, M.P., will be the principal guests at the annual luncheon of the Commercial Motor Users' Association, to be held at the Savoy Hotel on April 2.

The salary of **Mr. Arthur Ellis** as tramways engineer and manager of Cardiff Corporation tramways has been increased from £500 to £750 a year. As chief engineer and manager of the electricity department, Mr. Ellis receives also a salary of £500. The salary of **Mr. C. G. M. New,** deputy manager of the tramways, has been increased to £525 per annum.

The Shrewsbury S.T. and Challiner Tyre Company announce that **Mr. Birch,** who prior to taking up military duties was well known to a number of commercial vehicle users in the Lancashire area, has recently been demobilised and is now looking after their solid tyre interests in Liverpool and district. As reported in our columns recently, Mr. Baker, the pre-war representative of Messrs. Shrewsbury and Challiner for Liverpool, died in France from wounds.

The death of **Mr. T. P. Tierney,** after an attack of influenza, has taken place at Monkstown, Co. Dublin. Mr. Tierney was formerly connected with the Dublin United Tramways Company, and was well known in Ireland as a consulting engineer.

CONTRACTS AND ORDERS.

British Insulated and Helsby Cables, Ltd. have received an order for rail bonds from Bradford Corporation Tramways Committee.

T. Bolton and Sons are supplying five miles of copper trolley wire to Bradford Corporation, at £571 11s.

Walter Scott, Ltd., Leeds, are supplying 200 tons of tramway rails at £17 per ton, and 3 tons of fishplates at £21 12s. 6d. per ton, to Wolverhampton Corporation tramways.

Dick, Kerr & Co., Ltd. have a contract with Leicester Corporation for a 5,000 kw. turbo-alternator with switchgear, two 1,000 kw. rotary converters, condensers, superheaters, economisers, stokers, etc.

THE
ENGLISH ELECTRIC COMPANY
LIMITED.

Abchurch Yard, Cannon Street, London, E.C.4.

This Company, with a Capital of £5,000,000, has been formed to consolidate under one direction and management the various interests of the following companies, in all of which a predominating control exists:—

COVENTRY ORDNANCE WORKS, LTD.
DICK, KERR & CO., LTD.
PHŒNIX DYNAMO MANUFACTURING CO., LTD.
UNITED ELECTRIC CAR CO., LTD.
WILLANS & ROBINSON, LTD.

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PRICE LIST OF TRAMWAY AND OMNIBUS SHARES.

Dividends Prev.	Dividends Last.	Name.	Paid.	Price, July 27, 1914.	Cash Mar. 20 or previous.	A Week Ago.
5%	5%	Alabama Traction 5% 1st Mt. ..	—	67	67½	68
2/3	2/9	Anglo-Argentine 5½% 1st Pref.	5	4¾	65/3	67/6
2/9	2/9	Do. 5½% Cum. 2nd Pref. ..	5	4¾	60/-	65/-
4%	4%	Do. 4% Deb.	100	91	67	67
4½%	4½%	Do. 4½% Deb.	100	98½	70½	69½
5%	5%	Do. 5% Deb.	100	96	68½	68
—	—	Associated Omnibus Co., Ord. ..	5/-	3/32	1/2	1/2
6d.	1/-	Auckland Elec. Trams. Ord. ..	1	1 3/32	19/3	19/3
5%	5%	Do. 5% 1st Mt. Deb. ..	100	102½	88	87½
7%	7%	Barcelona Trac. 7% Pr. Lien ..	100	—	107½	107½
—	1/-	Bath Electric Trams Pref. Ord.	1	¼	3/5	3/5
6d.	6d.	Do. 5% Cum. Pref. ..	1	3/16	10/-	10/-
4½%	4½%	Do. 4½% 1st. Mort. Deb. ..	100	72½	68½	68½
4½%	4½%	Birmingham Dist. Pwr. and Tract. Co. 4½% 1st Deb. ..	100	84½	71½	71½
22/-*	14/-*	Bombay Elec. Sup. & Tram Ord.	10	14	23 1/16	23 1/16
6/-	6/-	Do. 6% Cum. Pref. ..	10	11½	10 1/16	10 1/16
4½%	4½%	Do. 4½% Deb.	100	96	76	76½
5%	5%	Do. 5% 2nd Mt. Deb. ..	100	100	89	89
$1	$1	Brazilian Trac. & Power Ord. ..	$100	66	54½	55½
$1½	$1½	Do. 6% Cum. Pref. ..	$100	97	89½	91
4/-	4/-	Brisbane Elec. Trams. Ord. ..	5	7½	5	5
2/6	2/6	Do. 5% Cum. Pref. ..	5	5	80/-	80/-
4½%	4½%	Do. 4½% 1st Deb. ..	100	101½	93½	93½
8%	8%	Brit. Col. Elec. Ry. Def. Ord. ..	100	107	40	43½
5%	5%	Do. Pref. Ord.	100	106	43	42
5%	5%	Do. 5% Cum. Pref. ..	100	108	60	61
4½%	4½%	Do. 4½% 1st Mt. Debs. ..	40	99½	83½	83½
4½%	4½%	Do. 4½% Perp. Con. Deb.	100	96½	61½	62½
£3*	£3*	Brit. Elec. Trac. Ord.	100	—	45	47½
6%	6%	Do. 6% Cum. Part. Pref.	100	—	77	79½
5%	5%	Do. 5% Deb.	100	92	84½	84½
4½%	4½%	Do. 4½% 2nd Deb. ..	100	77½	68½	68½
5%	5%	B. A. Lacroze 5% Mt. Deb. ..	100	100	74½	74½
5/6	2/6	Calcutta Tramways Ord. ..	5	7½	7 5/16	7 5/16
2/6	2/6	Do. 5% Cum. Pref. ..	5	5 1/16	81/3	81/3
4½%	4½%	Do. 4½% 1st Deb. ..	100	99½	71½	71½
1/-*	1/-*	Cape Elec. Trams.	1	1/16	15/-	15/1½
1/3	1/3	City of B. A. Trams	5	5½	81/3	81/3
4%	4%	Do. 4% Deb.	100	97½	71½	71½
5%	5%	Colombo Elec. Tram. & Ltg. Co. 5% 1st Mort. Deb.	100	95	80	80
5%	5%	Co. F.C. do. Jardin Botanico 5% 1st Mort. Bds.	100	93½	80½	80½
5%	5%	Costa Rica Elec. Lt. & Trac. Co. 5% 1st Deb.	—	63½	57½	57½
5/-	4/-	Dublin United Trams. Ord. ..	10	8	8½	8½
6%	6%	Do. 6% Pref.	100	—	105	105
—	—	Hastings & Dis. Elec. Tram Ord.	10/-	1/16	1/4	1/4
1/2½*	1/2½*	Do. 6% Cum. Pref. ..	1	3/16	9/6	9/6
4½%	4½%	Do. 4½% Deb.	100	67½	60½	60½
8½d.	7d.	Hong Kong Tramway	5/-	9/16	23/6	23/6
5%	5%	Do. 5% Deb. ..	100	87½	98½	98½
2/3	3/-	Isle of Thanet 5% Pref. .	5	2½	29/4½	29/4½
4%	4%	Do. 4% Deb.	100	73½	—	—
—	3%	Kalgoorlie Trams 6% B. Deb. ..	100	15	17½	17½
—	—	La Plata Trams. Ord.	1	½	2/6	2/6
9/6	7/-	Lanarkshire Trams Co. ..	10	10½	£10/9/3	£10/9/3
5%	5%	Lancs. Un. Trams 5% Pr. Ln.	100	85½	77	77
5%	5%	Lisbon Elec. Trams 5% Mt. Debs.	100	95	71	71
7½d.*	10½d.*	Llandudno & Colwyn B. Ord.	1	—	12/4½	12/4½
—	1½d.	London & Sub. Traction Ord. ..	1	½	3/3	3/3
6d.	6d.	Do. 5% Pref.	1	5/16	8/3	8/-
4½%	4½%	Do. 4½% 1 Mt. Deb. ..	100	75½	57½	58
4½%	4½%	L.G.O. 4½% 1st Deb.	100	100	84	83½
5%	5%	Do. 5% Inc. Deb... ..	100	88½	77	77
4%	4%	Lon. Unt. Trams. 4% 1st Mt. Db.	100	55	40½	40½
3/-	3/-	Madras Elec. 6% Pref. ..	5	5 1/16	84/6	84/6
5%	5%	Do. 5% Deb.	100	100	86	86
7½d.%*	9½d.*	Manaos Trams & Ltg. Ord. ..	1	9/32	4/6	4/6
5%	5%	Do. 5% 1st Deb.	100	77	67½	67½
$1½	$1½	Manila Elec. R. R. & Light ..	$100	102	95	94½
4½%	4½%	Met. Elec. Trams. 4½% Deb. ..	100	85½	73½	73½
5%	5%	Do. 5% Deb.	100	87	77½	77½
$1½	$1½	Mexico Trams. Common ..	$100	70	45½	45½
5%	5%	Do. 1 Mt. 5% G.B. ..	—	84	60½	61
—	—	Do. 6% Mt. Bds. ..	100	76	52½	53
4½%	4½%	Montreal Trys. Co. 4½% Stg. Dbs.	100	100	95½	95½
4½%	4½%	Do. 4½% Stg. Debs. (1922)	100	99	96	96
2/-	1/2½*	National Steam Car	1	15/32	17/-	16/9
9½d.*	9½d.*	New General Traction	1	½	8/3	8/6
8½d.	6d.	Northern Gen. Trans. Ord. ..	1	3/16	14/1½	14/1½
4/-	3/-	Para Elec. Rlys. Ord.	5	4½	5½	5 5/16
5%	5%	Do. 5% 1st Deb. ..	100	89½	82	81
—	—	Pernambuco Tram. & Power Ord	1	—	7/9	7/9
—	8½d.	Do. 7% Non. Cm. Part Pf.	1	—	16/-	16/-
5%	5%	Portland Ry. 5% 1st Mt. 30 yr.	—	96	—	—
8½d.*	8½d.*	Potteries Elec. Trac. Ord. ..	1	15/32	9/9	10/-
6d.	6d.	Do. 5% Pref.	1	5/32	11/7½	11/6
8d.	1/6	Provincial Trams. Ord. ..	1	½	19/10½	19/10½
3/-	3/-	Rangoon Tram. 6% Cum. Pref.	5	5½	82/6	82/6
5%	5%	Rhondda Trams. 5% 1 M. Deb.	100	88	79½	79½
5%	5%	Rio de Janeiro Try. & Pr. 1st Mt. 30 yr. 5% Gld. Bd. '35 ..	—	97½	93½	93½
5%	5%	Do. 1st Mt. 5% 50 yr. ..	100	89½	80½	81
5%	5%	Sao Paulo Deb. 5% 1st Mt. ..	$500	99	92½	93½
5%	5%	Do. 5% Perp. Deb. ..	100	99½	80½	80½
15/-	10/-	Shanghai Elec. Cons.	10	13	14 13/16	14 13/16
3d.	3d.	Singapore Elec. Trams. ..	5/-	¼	4/1	5/-
4%	4%	Sou. Met. Elec. Tram & Ltg. 4% Db	100	66	54	54
5%	5%	S. Elec. Trams. of B.A. 5% Mt. ..	—	100½	99½	99½
4½%	4½%	Toronto 1st Mt. 4½% Bds. ..	100	98	94½	94½
4½%	4½%	Tramways (M.E.T.) Omnibus 4½% Debs.	100	91	75	75
2/-	2/-	Un'd. El. Tr. Monte Video Ord.	5	4½	50/-	48/9
4½%	4½%	Winnipeg El. 4½% Deb. ..	100	94½	69	69
—	—	Yorks (W.R.) Elec. Trams. Ord.	5	½	27/6	27/6
3/-	3/-	Do. 6% Cum. Pref. ..	5	½	83/9	83/9
4½%	4½%	Do. 4½% 1st Deb.	100	85½	73	73
—	—	Metropolitan Dist. Ord. ..	100	21½	25	25½
—	—	Undgd. Elec. Rys. of London ..	10	21½	65/-	67/6
		Do. "A"	1/-	½	9/3	9/6
4½%	4½%	Do. 4½% Bds. of 1933 Rd.	—	99	103½	103½
6%	6%	Do. 6% 1st. Cum. In. Db.	100	114	103	103
4%	4%	Do. 6% In. Bonds Rd. ..	—	88	94½	94½

* Indicates dividend for the year. In other cases the dividend is for the half-year.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

Names.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C. ..	Mar. 11	461	501	+ 40	49	24,963	—
Aberdeen Corporation ..	" 12	2,204	2,497	+ 293	41	106,177	+ 17,235
Ayr Corporation ..	" 15	342	419	+ 77	43	24,039	+ 5,164
Birkenhead Corporation	" 16	1,893	2,215	+ 322	50	108,827	+ 16,078
Blackburn " ..	" 12	1,485	1,744	+ 259	50½	88,346	+ 13,827
Bradford Corporation ..	" 15	5,775	9,946	+ 4,171	50	463,243	+ 83,849
Burnley Corporation ..	" 15	1,960	2,715	+ 755	..	..	..
Burton-on-Trent Cor. ..	" 16	362	415	+ 53	50	20,628	+ 4,254
Bury Corporation ..	" 16	1,665	2,068	+ 403	50	101,911	+ 19,854
Chatham & District ..	" 6	1,161	1,236	+ 75	9	10,905	+ 264
Cork Electric	" 6	563	473	— 90	9	4,878	— 456
Derby Corporation ..	" 15	1,230	1,454	+ 224	50	74,493	+ 13,356
Dundee City	" 12	1,566	2,018	+ 452	43	84,219	+ 16,806
East Ham Corporation ..	" 15	1,343	1,714	+ 371	50½	78,234	+ 10,234
Glasgow Corporation ..	" 15	27,650	29,459	+ 1,809	41½	1,175,355	+ 87,153
Glossop (U.E. Sup. Co.) ..	" 15	178	223	+ 45	11	2,330	+ 388
Halifax Corporation ..	" 11	2,225	2,669	+ 444	49½	138,573	+ 19,153
do. Motor Buses ..	" 11	48	69	+ 21	49½	3,316	+ 874
Huddersfield Corporation	" 15	3,208	3,602	+ 394	50	180,922	+ 22,576
Ilford U.D. Council ..	" 15	793	1,062	+ 269	50	50,248	+ 12,116
Ipswich Corporation ..	" 1	626	666	+ 40	48	35,625	+ 3,899
Isle of Thanet	" 15	194	372	+ 178	23½	7,356	+ 3,245
Kilmarnock Corporation	" 15	225	269	+ 44	43½	11,514	+ 2,574
Lanarkshire	" 6	3,243	3,423	+ 180	9	33,741	+ 4,711
Leeds City	" 15	11,069	14,082	+ 3,013	50	677,732	+ 127,868
Leicester Corporation ..	" 15	4,251	5,096	+ 845	..	..	..
Leyton U.D. Council ..	" 13	1,779	2,662	+ 883	50	119,304	+ 26,467
Liverpool Corporation ..	" 15	16,752	21,088	+ 4,336	10½	209,788	+ 35,266
Llandudno & Colwyn Bay	" 14	270	318	+ 48	15	4,405	+ 873
London County Council ..	" 19	54,785	70,874	+ 16,089	50½	3,357,824	+ 583,483
Maidstone Corporation ..	" 13	251	286	+ 35	49½	14,100	+ 1,854
Manchester Corporation	" 15	23,695	27,481	+ 3,786	50	1,398,166	+ 243,910
Newcastle-on-Tyne Cor. ..	" 15	8,495	8,270	— 225	50	441,033	+ 44,224
Northampton Cor. ..	" 7	853	1103	+ 250	49	43,831	+ 2,245
Nottingham Corporation	" 13	4,802	6,478	+ 1,676	50	289,955	+ 64,403
Oldham Corporation ..	" 5	2,902	2,500	— 2	41	141,684	+ 25,756
Reading Corporation ..	" 13	1,203	1,390	+ 187	49½	64,668	—
Rhondda Tramways ..	" 6	1,552	2,104	+ 552	9	18,941	+ 4,672
Rotherham Corporation	" 12	2,000	2,060	+ 60	49½	112,249	+ 20,878
Sheffield Corporation ..	" 16	12,916	15,979	+ 3,063	50½	675,481	+ 53,586
Southampton Cor. ..	" 12	2,305	2,472	+ 167	49½	123,981	+ 20,037
Southend-on-Sea Cor. ..	" 12	697	1,184	+ 487	49	64,412	+ 21,622
South Shields Cor. ..	Feb. 15	1,036	1,131	+ 95	46	52,960	+ 8,639
Sunderland Corporation..	Mar. 16	1,943	2,793	+ 850	50	112,138	+ 18,329
Swindon Corporation .	" 12	294	288	— 6	49½	15,637	+ 1,594
Torquay Tramways ..	" 6	607	775	+ 168	9	6,547	+ 509
Tyneside Trys. & Trmrds.	Feb. 26	897	819	— 78	9	6,601	— 157
Wallasey Corporation .	Mar. 15	1,484	2,029	+ 545	49½	94,008	+ 16,163
Walsall Corporation ..	Feb. 15	1,082	1,202	+ 120	49	57,053	+ 10,850
Walthamstow U.D. Coun.	Mar. 15	1,201	1,458	+ 257	50	71,568	+ 11,167
Warrington Corporation	Feb. 20	744	815	+ 71	47	36,572	+ 8,396
West Ham Corporation	Mar. 13	3,733	4,872	+ 1,139	49½	228,264	+ 46,611
Wigan Corporation .	Jan. 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

Name.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Mar. 4	£56,938	£58,381	9	£487,368	— £7,286
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Jan. 5	4,505	4,504	40	35,478	+ 2,167
Brazilian Traction (Mrs.)	Dec.	8,069,000	8,531,000	52	101,894,000	+ 9,694,000
Brisbane	Feb.	32,009	34,380	8	72,955	+ 6,446
British Columbia .. $	Jan.	559,569	677,489	30	4,095,584	+ 612,355
Buenos Aires Lacroze ..	Feb.	34,397	42,429	34	343,209	+ 39,434
Burmah Tram. & Light Rs.	Jan.	25,430	38,265	26	214,804	+ 53,554
Calcutta .. .. Rs.	Mar. 1	74,605	88,622	8½	746,566	+ 118,557
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Feb.	4,031	2,351	8	6,006	— 2,036
Cordoba	Aug.	14,233	15,734	21	79,054	+ 8,740
East India	Feb.	1,318	1,689	30	13,612	+ 4,845
Hong Kong .. .. $	Jan. 18	12,272	13,983	3	40,422	+ 4,539
Kalgoorlie	Nov.	2,641	2,933	48	30,838	+ 1,274
La Plata	Feb.	4,746	5,698	8	11,428	+ 1,971
Lima	Dec.	43,198	47,887	52	527,839	+ 87,587
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Feb. 28	33,553	35,254	6	166,609	+ 17,415
Manaos .. .. Rs.	Aug.	150,657	182,507	34	1,152,686	+ 83,959
Manila .. .. $	Nov.	159,000	214,292	48	2,090,630	— 466,897
Montevideo	Feb.	34,578	38,772	17	149,821	+ 14,147
Para	Jan.	24,060	24,515	8	43,315	+ 940
Pernambuco	Mar. 9	4,726	5,686	9½	51,603	+ 4,901
Peruvian .. .. $	Feb.	925,410	943,470	34	7,973,835	— 229,195
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Feb.	5,662	5,694	8	12,067	+ 1,044
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore .. .. $	Feb. 1	13,181	16,852	5	77,240	+ 15,663
Toronto .. .. $	Jan.	1,068,319	1,106,840	4	1,106,840	+ 38,521
Winnipeg .. . $	Jan.	334,642	390,539	4	390,539	+ 55,897

WANTED.

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THE
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SATURDAY, MARCH 29, 1919.

THE TRAMWAYS WAGES AGREEMENT.

AFTER months of agitation and prolonged private negotiation, the representatives of Tramway Authorities and delegates of the tramway workers have arrived at a national agreement by which the wages of tramway employees are fixed and their hours of work regulated. The full text of the agreement is published in another column of this issue, and here we can only remark upon one or two of the more important considerations involved. The wishes of the employees have been met in a spirit of generosity and good will, and it may be hoped that peace will prevail in the tramway industry for a long time to come. The agreement reduces the normal working week of tramway employees to 48 hours, and the wages are to be the same as for a 54-hour week. Depot staff employees are given a 47-hour week at existing weekly wages. Regulations of hours of working and rates of overtime are also carefully framed for the purpose of safeguarding the concessions gained and increasing the remuneration of tramway employees wherever departure from the 48-hour week may be necessary. That is to say, the agreement aims inexorably at raising the cost of operating the tramway services. How the increased charge is to be met admits of only one answer, and the agreement gives it in the following clause : "That the recommendations contained in the preceding paragraphs are subject to powers being granted by the proper authorities to increase fares now limited by statute or otherwise." Sir Eric Geddes, when introducing the Transport Bill, stated that the average profit on tramway undertakings is 7 per cent. ; but it is impossible to understand by what process of reasoning his advisers arrived at the estimate, because we know it is very wide of the mark and can only suppose that he intended to refer to the gross profit, calculated without taking into account renewals, depreciation, interest and other necessary deductions. The small margin of profit on tramway undertakings as a whole, therefore, contains no resources for meeting a demand so large as is involved in the increased wages granted under the agreement, and the burden must be transferred to the tramway travelling public in the shape of higher fares. Whether that resource will prove quite adequate to the demand or will fail because of methods of economy adopted by the patrons of tramway services remains to be seen. War conditions have largely increased the local movements of urban populations, with consequent additions to tramway receipts, but even the highly-paid workers in munition factories and elsewhere have shown a disposition to economise wherever fares have been raised, as shown in the comparative decrease of short-distance fares on the systems affected. With the inevitable reduction in the spending power of the working classes following upon peace conditions, and a lowering of prices all round, that tendency is bound to gather force in the near future, and the outlook is far from promising. One other point is worthy of special note. Tramway authorities in these negotiations have been the sponsors for the interests of the general community, and if the operation of the agreement should lead to serious embarrassment of tramway enterprise, either through the unwillingness of the travelling public to share the burden entailed or the inability of tramway undertakings to make ends meet, the responsibility will lie with the other party to the agreement.

AMERICAN TRAMWAY RAILS FOR BIRMINGHAM.

A good deal of unnecessary alarm has been raised in the daily press over the purchase of a thousand tons of steel girder rails by the Tramways Committee of Birmingham Corporation from the Lorain Steel Company of Cleveland, U.S.A., at a cost of £16 15s. per ton. The fact is admonitory, and if it is taken by Labour, Capital and Government as a warning to get back to normal business conditions, the comment excited by the transaction may be of some use. In pre-war days such occurrences were not uncommon, and were generally regarded without alarm for the welfare of British industry, but rather as a healthy stimulus to enterprise and the maintenance of a bracing business atmosphere. It is true that Great Britain must conserve all her energies and increase the volume and value of her industrial production to recover the wealth lost in the war, and discharge the heavy financial obligations which the conflict has imposed. But neither the transaction itself nor the economic trend it may be held to signify can be regarded as inimical to the recuperation and enlarged development of British industry. The circumstances are altogether exceptional. Birmingham Corporation Tramways Committee had long been painfully aware of the bad condition into which the lines under its charge had fallen, and with praiseworthy zeal set out to remedy the evil at the earliest possible moment. Advertisement for a supply of tramway rails brought only three tenders in response, one of them American and two British. The latter could not undertake a binding time limit, and small blame to them ; but the American company undertook delivery within a few weeks, and its price was under that of its British competitors. It appears that, before closing with the Lorain Steel Company, the American firm, the Birmingham tramway authority stretched a point for patriotism and sought tenders from other British firms, but without avail. Their paramount and immediate duty was to put the tramway system of Birmingham into a proper condition with the least possible delay, and it was only by accepting the offer of the American rails they could hope to meet the requirements of the situation. The Birmingham Tramways Committee took the only sensible course, and closed with the American offer. If the sight of rails from Cleveland, U.S.A., in Birmingham, however, should stimulate British statesmen, Labourists and Capitalists to renewed efforts towards adjustment of industrial affairs, the occurrence will not be without advantage to the nation.

Mr. Alfred Baker, general manager of the tramways, has stated to newspaper representatives that considering their total requirements in rails, the contract was not a very large one, but it was a matter of urgency. The Committee were very anxious to make an early start, so as to put the lines in order during the summer months. The American firm made the best offer not only in regard to delivery, which was promised in April, but also in regard to price and quality, and the Committee had no alternative but to accept. Mr. Baker pointed out that no new principle was involved, inasmuch as 2,000 tons of rails were purchased from the Lorain Company in 1915, when English producers could not supply.

Summer Time will commence on the night of Sunday next, March 30-31, and will continue until the night of Sunday, September 28-29.

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TERMS OF AGREEMENT FOR TRAMWAY WORKERS.

The following terms of agreement were arrived at between representatives of the Municipal Tramways Conference, the Tramways and Light Railways Association, and the National Transport Workers' Federation, on Thursday, March 20th, 1919, after negotiations extending over several months.

1. (*a*) That the working week shall consist of 48 hours inclusive of signing on and signing off.
   (*b*) That with regard to the Undertakings working 54 hours or more per week, the Employees shall receive 54 hours' wages for 48 hours' work.
   (*c*) That with regard to Undertakings working more than 54 hours per week, the Employees shall receive in respect of the reduced working week wages equal to those received for the number of hours at present worked up to a maximum of 57 hours.
   (*d*) That a Joint Committee be appointed by the parties to this agreement to consider and determine special cases as outlined below :—
      (1) Where it is claimed under Clause 1 (*b*) that a special consideration has already been given in respect of a reduced working week.
      (2) Where it is claimed under Section 1 (*b*) and/or (*c*) that the normal working week is in excess of six days.
      (3) Where a difference arises between the respective parties as to the exact number of hours worked per week.
   (*e*) In so far as the Metropolitan area is concerned, 48 hours shall constitute the normal week's work without reduction in pay.
2. (*a*) That every Employee shall be guaranteed a working week of 48 hours inclusive of signing on and signing off, or payment equivalent thereto, provided that such Employee has presented himself for work at the appointed times on each of the six days, and, further, the Employers shall be at liberty to utilise the services of any Employee for whom work cannot be found upon the cars, upon such other work as may be considered desirable by the management, subject to such work not impinging on another man's job, and being only of a temporary character.
3. (*a*) That 8 hours constitute a normal day's work, subject to local adjustment as agreed, or, at the request of the Employees concerned, for working a shift of less or more than 8 hours.
   (*b*) Provided that if a duty exceeds 9 working hours, inclusive of signing on and signing off, overtime to be paid from the expiration of 8 hours, and if the day's duty is less than 8 hours, but not less than 7 hours, ordinary time to be paid for the time actually worked, but if less than 7 hours, then the Employee shall receive 7 hours' pay.
4. That the question of spread-over time be left to each undertaking to confer thereon with the representatives of the Trade Union with a view to reducing the same to the lowest possible minimum, and the consideration of the same to be brought forward again for discussion not later than the 1st July next.
5. (*a*) That in respect of four National Holidays, viz., Easter Monday, Whit Monday, August Bank Holiday, and Boxing Day, time and a half rates shall be paid ; but in regard to Scotland, four General H lidays shall be substituted for the above-named Bank Holidays, to be mutually arranged to meet local circumstances.
   (*b*) In respect of Christmas Day (or in Scotland, New Year's Day) double time shall be paid in those Undertakings where worked.
   (*c*) That in respect of Good Friday, ordinary rates shall be paid, except in those cases where additional rates are paid which shall continue.
   (*d*) That in respect of Sunday labour, time and a quarter rates shall be paid, but where additional rates are now paid, such higher rates shall continue.
   (*e*) That overtime shall be paid at the rate of time and a quarter for the first two hours and time and a half for any additional work beyond in respect of each day exceeding 9 hours, such overtime to be calculated from the termination of 8 hours' work.
   (*f*) That overtime rates shall be paid over a normal working week of 48 hours ; where the general terms of daily duty have been 9 hours or less, such overtime shall be accumulative and paid for on a weekly basis at time and a quarter for the first two hours and time and a half for any additional work beyond.
   (*g*) Subject to the provisions outlined in Clause 2 (*a*) and Clauses 5 ( ) and 5 (*f*), a margin of two hours shall be allowed to be averaged on each fortnight, viz., 46 hours minimum and 50 hours maximum in each of the two weeks without overtime rates being operative ; but if the working hours per fortnight exceed 96 hours, an overtime rate of time and a half shall be paid, irrespective of whether overtime rates have been paid on the daily basis, on all time in excess of the said 96 hours.

   [*Note.*—If the agreed margin be varied in any one week, viz., if 50 hours be exceeded, then overtime rates shall commence from the expiration of 48 hours, as provided for in Clause 5 (*f*).
   (*h*) In the event of an employee working voluntarily on his seventh or rest day, he shall be paid for such work at the rate of time and a quarter on the rate of pay prevailing that day.
6. (*a*) That six day' holiday with pay annually be granted after 12 months' continuous service, with an additional two days for the year 1920. In the meantime the question of holidays shall be referred to the Joint Industrial Council for decision.
   (*b*) That this arrangement with regard to six days' holiday shall date from the present year.
   (*c*) That the holiday period shall, as far as practicable and subject to local conditions, be granted between the 1st April and the 31st October in each year.
   (*d*) That in calculating holidays for the purpose of payment, rest days shall not be included.
   (*e*) That no employee shall be entitled to payment in lieu of holidays.
7. (*a*) That depot day staff employees shall be granted a working week of 47 hours at existing weekly wages.
   (*b*) That depot night staff employees shall be granted a working week of 48 hours at existing weekly wages, such hours to include a meal time allowance of not less than 30 minutes each night.
   (*c*) That the maximum number of hours to be paid for in respect of the reduced working week, referred to in 7 (*a*) and 7 (*b*) shall be 57, except with regard to the Metropolitan area, where the normal working week has been in excess hereof.
8. (*a*) That the terms of this Agreement, so far as they affect the new rate of pay, payment for overtime, and extra work shall operate as and from the commencement of the working week terminating prior to the first day in April, 1919.
   (*b*) That the employers shall use their best endeavours to bring the whole scheme for a reduced working week into operation as soon as they can obtain the necessary labour to enable them to do so.
9. That the recommendations contained in the preceding paragraphs are subject to powers being granted by the proper Authority to increase fares, now limited by Statute or otherwise, before 30th June next, and that failing the granting of these powers by that date, this Agreement shall be terminable on the receipt of one month's notice from either side.
10. That nothing in this Agreement shall operate to the prejudice of any privileges or emoluments or conditions of service which an employee in an undertaking is now in receipt of.
11. Permanent way employees, whose services are of a temporary character, shall be excluded from the provisions of this Agreement.
12. That in the event of any dispute arising between the parties hereafter as to the interpretation of any portion of this Agreement, the same shall be referred to the Joint Industrial Council, or, pending the formation thereof, the Joint Committee referred to in Clause 1 (*d*) for settlement.
13. Provided that this Agreement shall not apply to employees whose wages and conditions of labour are governed by other Trade Union Agreements and awards.

RE-ENGAGEMENT OF DEMOBILISED MEN.

Nearly every tramway authority in the country undertook to reinstate after the war employees who had been in their service before August, 1914, and who became members of His Majesty's forces. It need hardly be said that the engagement is being carried out fully. But demobilisation has brought to light another problem. Many men of military age took the places of those who had volunteered ; some enlisted subsequently, and others were called up under the Conscription Act. In consequence, demobilisation has set free a larger number of tramway employees than were in the service before the war ; reinstatement of every man who worked as a tramway man before being called up is therefore impossible. A number of the new men are required, and the problem is to find a method by which reinstatement can be arranged without suspicion of unfairness or partiality. Mr. William Marsh, engineer and manager of Brighton Corporation Tramways, has devised a scheme for solving the problem. Under this scheme, the priority of a man for re-engagement is determined by the number of months of service after engagement added to the number of months of war yet to run at the date when he entered the tramway service. The term of the war is given as 50 months, starting with August, 1914, each successive month reducing the figure by one. For example, Conductor was engaged in September, 1914, and joined up in November, 1915 ; his priority number, therefore, is 49, which, added to his 15 months of service, makes a total of 64. Another man engaged in, say, January, 1915, has a priority figure of 45, and if he joined up 11 months later, that number is added, making, in that case, 56. Mr. Marsh stipulates that the highest aggregate should have precedence. The only defect of the scheme, it seems to us, is, that it gives service with the tramway a greater value than service with the colours.

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L.C.C. TRAMWAY MATTERS.

NEW HIGHWAYS COMMITTEE.—At the meeting of the London County Council on Tuesday, the following were appointed members of the Highways Committee :—Messrs. P. Dawson, J. M. Gatti, H. J. A. Glanville, Capt. A. O. Goodrich, H. H. Gordon, G. H. Hume, J. H. Harley, Lieut.-Col. A. C. H. Kennard, J. J. McClelland, S. March, Lieut.-Col. E. W. Morrison-Bell, A. Cooper Rawson, A. H. Scott, J. Speakman, W. J. Squires, R. G. Taylor, Henry Ward and Brig. Gen. W. W. Warner.

PROVISION FOR RENEWALS.—The Council on March 20, 1917, decided that for a period of two years from April, 1917, any surplus available from the working of the tramways should be paid into the renewals fund, and that the basis of the provision to be made for the renewal of certain portions of the tramways should be reconsidered at the end of that per od. The Highways Committee reported that there were difficulties in determining the question at the present juncture, and they accordingly recommended that the present arrangement should be continued and that the matter should be again reviewed at the end of six months. The Finance Committee concurred in the proposal.

PAY OF CONDUCTORS WHILE LEARNING.—The rates of pay for motormen and conductors while learning was fixed at the rate of 3s. 6d. a day from March, 1919. The men also received a grant of 6d. a day in connection with the cost of living. The rate of pay for motormen, while learning, has been increased from time to time, but the rate of pay for conductors has not been altered since 1915, and the Highways Committee recommended that they should now be paid 3s. 6d. a day, plus 1s. 6d. a day war wages.

CARS OUT OF SERVICE.—Mr. P. A. Harris asked (1) how many tramcars are at present out of service ; (2) was the cause due to shortage of spare parts, or of drivers ; (3) were any new men being trained ; (4) were orders being placed for new cars ; and (5) what steps generally were being taken to obviate the present scandal of overcrowding.

Mr. Hume replied that the number of cars short of timetable requirements was 56 and 3 trailers; the shortage was due to an insufficient supply of spare parts for the repair of cars ; 46 men were undergoing training as motormen and additional trained motormen were returning each week from war service. No orders were being placed for new cars, but contractors were being urged to expedite the delivery of materials, and as these and spare parts became available, car services would be augmented.

MISCELLANEOUS NEWS AND NOTES.

Track Renewals at Bradford.—The renewal of the track on the Manchester and the Thornton road routes is to be taken in hand as soon as possible.

Fares on the London United Tramways.—The London United Tramways Company propose to apply to the Board of Trade for sanction to a further increase in fares.

Projected Light Railways.—Devonshire County Council is considering plans for a number of projected light railways. A light railway is to be constructed between Elgin and Dallas.

Motor Omnibuses for Edinburgh Corporation.—The City of Edinburgh is inviting tenders for fifteen motor omnibuses. Further particulars will be found in our advertisement columns.

Slough Motor Depot.—As a result of discussions in the House of Lords and the House of Commons this week, the Government have agreed to the appointment of a committee to investigate the Slough motor depot scheme.

Concession to Huddersfield Employees.—Huddersfield Tramways Committee have granted the workers in the tramway depot a 47-hour week with pay at the 50-hour rate. Night-workers' hours will be altered pro rata.

Maidstone Tramway Fares.—Maidstone Tramways Committee propose to ask the Board of Trade for power to increase tramway fares by 100 per cent. The application will be made conjointly with other local authorities.

Joint Industrial Council.—Huddersfield Tramways Committee have signified their willingness to be parties to the Joint Industrial Council for the tramway industry, the constitution of which was given in our issue of March 13th.

Motor Omnibuses for Londonderry. — The Council have purchased six single-deck motor omnibuses at an estimated cost of £1,530 each. Application is to be made to the Road Board for a grant to improve the road surface and to acquire land for a garage.

More London Tube Trains.—Improved facilities are now provided on the Piccadilly Railway, the service having been increased from 18 to 24 trains per hour between 10 a.m. and 5 p.m., with a corresponding improvement in the after-theatre service. This additional accommodation materially relieves congestion.

Municipalities and the Transport Bill.—Among the municipalities which have passed resolutions viewing with great concern the proposals that the future control of electricity is to be taken out of the hands of the Board of Trade and put under the control of the proposed Ministry of Ways and Communications are Bradford, Carlisle, Edinburgh, Glasgow, Huddersfield, and Manchester.

The Railway Puzzle.—Sir Eric Geddes has stated that the loss on the railways now amounts to 100 million sterling a year. "F.D.H.L.," in a letter published in the "Times" explains that the Government during the war have not paid, and are not now paying, the railways for the conveyance of troops, military stores, etc., and estimates the cost of these services rendered to the Government at something near 200 million pounds per annum.

Stoppage on Plymouth Tramways.—The Plymouth tramway service was suspended for over an hour on March 21, owing to an accumulation of water in the basement of the electric power station at Princes Rock. A flue was choked with water and it was necessary to call the local fire brigade to pump it out.

London Tramway Extensions.—The City of London Corporation has received a letter from the London County Council asking the consent of the Corporation to the introduction of a bill in Parliament in which the Council seek for authority to construct tramway extensions and connecting links. The letter has been referred to the Streets Committee, with instructions to confer with the Central Markets Committee, and the Committee is authorised to oppose the Bill.

Omnibus Employees' Wages.—On Thursday at Electric Railway House, Westminster, a conference took place with the representatives of the four London omnibus companies on the application of the Federation for the same working hours as those which have been granted to tramway employees. After three hours' discussion the conference was adjourned and a further meeting took place yesterday. The proceedings were conducted in private, but we understand that the prospect of a satisfactory settlement is very favourable.

Objection to Increased Fares.—Mr. T. Barnett, of the Sheffield District Council of the National Union of Railwaymen, at a recent meeting, deprecated the action of the Sheffield City Council in increasing tramway fares. He remarked that it was an attack on the working class and unfair. The Corporation have given £5,000 out of the tramway profits to the University, and although he was a keen student of education, he did not think it was right that the working classes should pay for the education of the upper classes.

Omnibus and Tube Fares raised in London.—As the reduction of hours at former rates of pay granted to railwaymen and other sections of transport workers will have immediate effect in adding to the operating costs, already swollen by the high prices paid for the materials necessary to maintenance, the management of the London Underground Railways and the London General Omnibus Company have raised fares on sixteen omnibus routes as from March 27th. The revised fares on the principal Underground Railway services will take effect on April 6th.

Glasgow Parcel Service.—It has been decided to discontinue the special car service in Glasgow for the conveyance of parcels from the centre of the city to Uddingston. The experiment was made for three months at the request of the Road Transport Board, who suggested that the carriage of parcels by tramway cars to various parts of the city would remove the congestion of railway and motor traffic in these districts. The service has, however, been little used, and the experiment confirms the view expressed by the local tramway officials when the suggestion was first made.

Road Deterioration.—Sir Robert Woods, in the House of Commons on Tuesday asked the President of the Local Government Board whether, with a view to preventing unnecessary deterioration of roads, he would introduce a regulation fixing a definite relation between the width of tires and the number of wheels, their diameter, and the maximum load of vehicles. Major Astor replied that the Local Government Board had no power to make such a regulation for vehicular traffic generally. Such powers as it possessed with respect to vehicles would be transferred to the new Ministry of Ways and Communications when constituted.

Effect of War on Tramway Services.—In a memorandum to the Leeds Corporation Tramways Committee, Mr. J. B. Hamilton, general manager, has stated in detail the conditions which have rendered operation of tramway services difficult. Seventy per cent. of the outside staff was taken for military service, and the places of the men were only partially filled by women. Severe weather conditions and scarcity of materials and labour for repairs caused numbers of cars to fail in working. Notwithstanding the reduced number of runs and cars working, there had been an increase of about two million passengers.

Action against Sheffield Corporation.—Judgment was given against Sheffield Corporation for £450 damages and costs in an action brought by Mrs. Maria Matthews at the Leeds Assizes for the loss of her husband through the alleged negligence of the defendants. The case for the plaintiff was that on July 19th last her husband was driving a steam wagon in Attercliffe Road, Sheffield, when a tramway car crashed into the rear of the vehicle, and the deceased man was crushed between the wagon and a tramway standard. He died from his injuries. For the defendants it was maintained that the wagon had cleared the tramway lines before power was applied to the tramway car.

Tramways and the Transport Bill.—In introducing the Bill establishing the Ministry of Ways and Communications, Sir Eric Geddes expressly stated that municipal tramways were excluded from its purview. The text of the Bill confirms this statement, and the purchase of municipal tramways by the Ministry will be possible only by agreement. It has, however, been brought to the notice of the Government that in practice the Bill might operate disadvantageously to the municipalities for the reason that as it stands there is nothing in it to prohibit the Ministry from taking possession of any municipal tramway during the two years of temporary control which the Bill sanctions. The Government have, however, no intention of nationalising municipal tramway undertakings, and Sir Eric proposes to move an amendment in Committee making it clear that control can be acquired during the controlled years only by consent of the local authority.

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Liverpool Deputation to America.—On the motion of the chairman, Alderman E. Russell Taylor, the Liverpool Tramways Committee have resolved to recommend to the City Council that a deputation consisting of members and officials should be sent to visit the chief cities in the United States and Canada in order to inspect the most up-to-date methods of civic transportation. The chairman pointed out, that at the time when a large capital expenditure on the tramways of Liverpool and district was contemplated, the report of such a deputation as was proposed would enable the City Council to determine whether the necessary development of the car service should be (1) by lines on the present overhead system, (2) by an underground network, or (3) by express cars running on tracks placed at the sides of the widened roads.

The Industrial League Journal for March includes a twelve-page supplement containing an address by the Rt. Hon. G.N. Barnes, M.P., to managers and foremen on industrial matters. Mr. H. E. Blain, operating manager of the London Underground Railways, contributes an interesting article on "Industrial Honour." In answer to the question: What is Industrial Honour from the standpoint of employers and employees alike? Mr. Blain says that it means that a pledge given either in writing or by words should be regarded as inviolate. Whatever its difficulties of fulfilment and whatever its consequences, it should not be departed from unless by agreement. In view of all the difficulties encountered, both employers and employees must make a greater endeavour to realise the point of view of the other; to believe honestly that both desire to see the dawning of a new era from which shall be banished for ever the suspicion of the past.

Defective Tramway Lines.—At Newington, London, an inquest was held on the body of a woman who had been killed in a street accident, said to be due to the defective condition of London County Council tramway lines. It appeared that when a motor van was passing a pony cart loaded with wood going in the same direction, the hind wheel of the van skidded in the tramway lines, causing the van to collide with the pony cart, upsetting it. The woman, who was in charge of the cart, was struck by one of the pieces of wood and killed instantly. According to a police witness, the check rail of the tramway line at that spot was completely gone for a distance of several yards, and some of the wood blocks had sunk three to four inches. The Coroner, Mr. G. P. Wyatt, commented severely on the bad condition of the tramway lines, to which he considered the accident was wholly due, and the jury agreed with him.

Linking-up of Sunderland Tramways.—From the local press it appears that there is a movement afoot to bring about a connection between the tramway undertaking of Sunderland Corporation and the lines of the Sunderland District Electric Tramways Company. The two systems meet at Grangetown, on the outskirts of Sunderland, but there is no interchange of running powers between them, so that an average of 12,000 persons weekly have to change from the one system to the other. But the absence of connection between the borough and district tramways seems to be responsible for evils much more serious than inconvenience to passengers. In a letter to the *Sunderland Echo*, Mr. R. Milbanke Hudson, M.P., advocates the connecting of the borough tramways with the dock railways and the district lines, so that goods might be run straight from the steamers into the country. Mr. Hudson's scheme is very extensive and would serve to develop the port of Sunderland, but it is quite impracticable unless the Sunderland Corporation and the District Electric Tramways Company come to an agreement.

CONTRACTS AND ORDERS.

Southend Light Railways and Electric Lighting Committee have recommended the acceptance of a tender of the Niclausse Boiler Company, London, for a boiler, superheater and accessories at £12,000.

Edgar Allen and Company' Ltd., have an order for points and crossings from Southend-on-Sea tramways, at a cost of £665.

Birmingham Corporation have placed an order with the Brush Electrical and Engineering Company for fifty tramway cars.

Bradford Tramways Committee have authorised the payment of a royalty of 5s. per ton to Mr. C. P. Sandberg for the use of his patent high silicon steel process on steel rails required for track renewals.

FINANCIAL.

Southampton Corporation Tramways will contribute £8,000 to the relief of rates for 1919-20.

Hong Kong Tramways Company have declared a further dividend of 10d. per share, making 28½ per cent. for the year, against 23 per cent. last year.

Manila Electric Railroad and Lighting Corporation.—A dividend has been declared of 1½ per cent. (1·50) per share for the quarter ended March 31.

The Mirrlees Watson Company have declared a dividend of 10 per cent. and a bonus of 2½ per cent., both less tax, for the past year. The rate was the same a year ago.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended Mar. 26 amounted to £71,085, an increase of £15,012 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to March 26 (fifty-one and a half weeks) the total receipts were £3,428,912, an increase of £598,497 on the corresponding period of 1918.

PERSONAL.

Mr. E. Holt, general manager of Ashton-under-Lyne Corporation tramways, has been granted an increase in salary.

Mr. H. Dyson, of Huddersfield Corporation tramways, has been granted an honorarium for extra services as chief cashier during the present year.

Mr. C. D. Braidwood, of Leeds Corporation tramways department, has been appointed superintendent of the Metropolitan Electric Tramways.

Mr. H. F. Street, who has been borough electrical engineer of Southampton for the past eighteen years, has, owing to eye trouble, tendered his resignation.

Captain C. Burgess, R.E., general manager of the West Hartlepool Corporation tramways, has resumed his duties. Captain Burgess has been absent on service since 1915, and has been two and a half years in Mesopotamia.

The King of the Belgians has been graciously pleased to create **Mr. Philip Dawson,** M.Inst.C.E., M.I.Mech.E., M.I.E.E., "Chevalier de l'Ordre de Leopold," in recognition of his services as a member of the Belgian Royal Commission on the electrification of the Belgian State Railways.

Sir Edgar Speyer.—The Home Secretary, in the House of Commons on Tuesday, stated that the question of the revocation of Sir Edgar Speyer's certificate of naturalisation had been referred to the Certificates of Naturalisation (Revocation) Committee, but he could not say when a decision would be reached.

Mr. E. Sidgwick, who was recently appointed superintendent of Southport Corporation tramways, has been presented with a solid silver fruit dish and a pair of silver vases from the employees at Rochdale, where he has previously been rolling stock superintendent. Mr. George Webster, general manager, spoke highly of Mr. Sidgwick's services during the past eleven years, and Mr. A. Marsden made the presentation.

Mr. G. G. L. Preece, Lieutenant Lancashire Fusiliers, T.F. and R.E., has been demobilised and has returned to his old post as branch manager of the Manchester district for Messrs. Bruce, Peebles and Company, Ltd., Edinburgh. His address as before is 30, Cross Street, Manchester.

Mr. Charles E. Inglis, University lecturer in mechanical engineering, has been elected to the professorship in Mechanism and Applied Mechanics at the University of Cambridge, in succession to the late Professor Bertram Hopkinson. The stipend is £850 per annum, with £450 from the receipts of the department.

Mr. T. Metcalf, who has been manager of the Swindon Corporation tramways, has been appointed general manager by the Tramways and Electricity Committee, and **Mr. F. Newey,** who has hitherto been acting electrical engineer, has been appointed electrical and mechanical engineer.

Mr. T. Inglis Rudman has taken up his duties as tramway permanent way engineer for Sunderland Corporation, at a salary of £300 per annum. There were seventeen applicants for the post. Mr. Rudman served his articles in the Midland Railway civil engineering department at Derby, and afterwards was resident engineer at Aberdare, Norwich, and on the Tyneside, and has since been surveyor in the works department of the Ministry of Munitions at Bristol. He has had much foreign experience in Costa Rica, the Argentine, Chili, Peru, and Panama. Just before going to Sunderland, Mr. Rudman was with Messrs. Clegg and Sons, a Manchester firm of engineers.

We regret to record the death of **Mr. W. H. S. Dawson,** city engineer of Bradford, which took place on Saturday last at the age of 58. Mr. Dawson was responsible for the construction and maintenance of the permanent way of the tramways.

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TRAMWAY TRACK CONSTRUCTION AND MAINTENANCE.

By R. BICKERSTAFFE HOLT,
Late Highways and Permanent Way Engineer,
City of Leeds.

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POSITIONS VACANT.

CITY OF COVENTRY.

Tramways Department.

Permanent Way Superintendent.

The Tramways Committee invite applications from qualified Civil Engineers for the position of Permanent Way Superintendent under the General Manager and Engineer of Tramways.

Applicants must have had practical experience in the construction and maintenance of tramway permanent way and accustomed to the control and management of men.

Commencing salary £300 per annum, advancing by two six-monthly increments to £350 per annum.

Applications, stating age, full qualifications, etc., together with copies of three recent testimonials, and endorsed "Permanent Way Superintendent" must be delivered at my office not later than 12 noon, Wednesday, April 9th, 1919.

T. R. WHITEHEAD,
General Manager and Engineer.

Tramway Depot, Priestley's Bridge,
Coventry.

COUNTY BOROUGH OF OLDHAM.

The Oldham Corporation Electricity Committee invite applications for the position of Shift Engineer, in charge of an eight-hour shift. Weekly wage, £4 14s. 7d., including all war bonuses up to date.

Applicants must have had a good mechanical and electrical training, and must also have had previous experience in an electric generating station giving L.T. direct and E.H.T. supplies.

Applications, endorsed "Shift Engineer," stating age, experience, etc., together with copies of not more than three recent testimonials, to be sent to MR. FRED L. OGDEN, Borough Electrical Engineer, Greenhill Electricity Offices, Oldham, not later than Wednesday, 9th April, 1919.

Canvassing will be a disqualification.

J. H. HALLSWORTH,
Town Clerk.

Oldham, 24th March, 1919.

CITY OF EDINBURGH.

Tramways Department.

The Corporation of Edinburgh invite applications for the position of Traffic Superintendent. Applicants must have had tramway experience in a similar capacity. Salary £450 per annum.

Applications, giving full particulars as to age, qualifications and experience, together with twenty copies of not more than three testimonials, should be sent to me not later than 12 o'clock noon on Saturday, April 12th, 1919.

A. GRIERSON, S.S.C.
Town Clerk.

City Chambers, Edinburgh,
March 15th, 1919.

BOROUGH OF ACCRINGTON.

Tramways Department.

Applications are invited for the position of Chief Traffic Inspector. Applicants must have had tramway experience in a similar capacity and would be required to act as instructor to Motormen. Salary: £208 per annum. Applications, giving full particulars as to age, qualifications, and experience, together with copies of not more than three recent testimonials, to be forwarded to the undersigned not later than 7th April, 1919.

H. PILLING,
General Manager.

Platelayers.

Platelayers wanted, with good experience of tramway repairs. Must be good timekeepers and able to handle men. Apply with references and stating wages required to General Manager, Corporation Tramways, Priestley's Bridge Depot, Coventry.

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PRICE LIST OF TRAMWAY AND OMNIBUS SHARES.

Dividends Prev.	Dividends Last.	Name.	Paid.	Price, July 27, 1914.	Cash Mar. 27 or previous.	A Week Ago.
5%	5%	Alabama Traction 5% 1st Mt. ..	—	67	68¾	67½
2/9	2/9	Anglo-Argentine 5½% 1st Pref.	5	4¾	62/6	65/3
2/9	2/9	Do. 5½% Cum. 2nd Pref. ..	5	4¾	60/-	60/-
4%	4%	Do. 4% Deb.	100	91	68	67
4½%	4½%	Do. 4½% Deb.	100	98½	71	70½
5%	5%	Do. 5% Deb.	100	96	66½	68½
—	—	Associated Omnibus Co., Ord. ..	5/-	3/32	1/2	1/2
6d.	1/-	Auckland Elec. Trams. Ord. ..	1	1 1/32	19/3	19/3
5%	5%	Do. 5% 1st Mt. Deb. ..	100	102½	88	88
7%	7%	Barcelona Trac. 7% Pr. Lien ..	100	—	107½	107½
—	1/-	Bath Electric Trams Pref. Ord.	1	¾	3/5	3/5
6d.	6d.	Do. 5% Cum. Pref. ..	1	3/16	10/-	10/-
4½%	4½%	Do. 4½% 1st. Mort. Deb. ..	100	72½	68½	68½
4½%	4½%	Birmingham Dist. Twr. and Tract. Co. 4½% 1st Deb. ..	100	84½	72	71½
28/-*	14/-*	Bombay Elec. Sup. & Tram Ord.	10	14	23 3/16	23 3/16
6/-	6/-	Do. 6% Cum. Pref. ..	10	11½	10 11/16	10 11/16
4½%	4½%	Do. 4½% Deb.	100	96	76	76
5%	5%	Do. 5% 2nd Mt. Deb. ..	100	100	89	89
$1	$1	Brazilian Trac. & Power Ord. ..	$100	66	55¾	54¾
$1½	$1½	Do. 6% Cum. Pref. ..	$100	97	90	89½
4/-	4/-	Brisbane Elec. Trams. Ord. ..	5	7½	5	5
2/6	2/6	Do. 5% Cum. Pref. ..	5	5	80/-	80/-
4½%	4½%	Do. 4½% 1st Deb. ..	100	101½	93¾	93¾
8%	8%	Brit. Col. Elec. Ry. Def. Ord. ..	100	107	40	40
6%	5%	Do. Pref. Ord.	100	106	38½	43
5%	5%	Do. 5% Cum. Pref. ..	100	103	61½	60
4½%	4½%	Do. 4½% 1st Mt. Debs. ..	40	99½	83½	83½
4½%	4½%	Do. 4½% Perp. Con. Deb.	100	96½	61½	61½
£3*	£3*	Brit. Elec. Trac. Ord.	100	—	45	45
6%	6%	Do. 6% Cum. Part. Pref.	100	—	77	77
5%	5%	Do. 5% Deb.	100	92	84½	84½
4½%	4½%	Do. 4½% 2nd Deb. ..	100	77½	68½	68½
5%	5%	B. A. Lacroze 5% Mt. Deb. ..	100	100	73½	74½
5/6	2/6	Calcutta Tramways Ord. ..	5	7½	7 1/16	7 1/16
2/6	2/6	Do. 5% Cum. Pref. ..	5	5 1/16	81/3	81/3
4½%	4½%	Do. 4½% 1st Deb. ..	100	99½	71½	71½
1/-*	1/-*	Cape Elec. Trams.	1	1 1/16	15/-	15/-
1/3	1/3	City of B. A. Trams	5	5½	81/3	81/3
4%	4%	Do. 4% Deb.	100	97½	71½	71½
5%	5%	Colombo Elec. Tram. & Ltg. Co. 5% 1st Mort. Deb.	100	95	80	80
5%	5%	Co. F.C. do. Jardin Botanico 5% 1st Mort. Bds.	100	93½	80½	80½
5%	5%	Costa Rica Elec. Lt. & Trac. Co. 5% 1st Deb.	—	63½	57½	57½
4/-	7/-	Dublin United Trams. Ord. ..	10	8	7¾	8½
6%	6%	Do. 6% Pref.	100	—	105	105
—	—	Hastings & Dis. Elec. Tram Ord.	10/-	1/16	1/4	1/4
1/2½*	1/2½*	Do. 6% Cum. Pref. ..	1	9/16	9/6	9/6
4½%	4½%	Do. 4% Deb.	100	67½	60½	60½
8½d.	7d.	Hong Kong Tramway	5/-	7/16	23/6	23/6
5%	5%	Do. 5% Deb.	100	87½	98½	98½
2/6	3/-	Isle of Thanet 5% Pref. ..	5	2¼	30/3	29/4½
4%	4%	Do. 4% Deb.	100	73½	—	—
—	3%	Kalgoorlie Trams 6% B. Deb. ..	100	15	16½	17½
—	—	La Plata Trams. Ord.	1	½	2/6	2/6
9/6	7/-	Lanarkshire Trams Co. ..	10	10½	£10/9/3	£10/9/3
5%	5%	Lancs. Un. Trams 5% Pr. Ln.	100	85½	77	77
5%	5%	Lisbon Elec. Trams 5% Mt. Debs.	100	95	71	71
7½d.*	10½d.*	Llandudno & Colwyn B. Ord.	1	—	12/4½	12/4½
—	1½d.	London & Sub. Traction Ord. ..	1	3/16	2/6	3/3
3d.	6d.	Do. 5% Pref.	1	5/16	7/-	8/3
4½%	4½%	Do. 4½% 1 Mt. Deb. ..	100	75½	57½	57½
4½%	4½%	L.G.O. 4½% 1st Deb.	100	100	81	84
5%	5%	Do. 5% Inc. Deb.	100	88½	77	77
4%	4%	Lon. Unt. Trams. 4% 1st Mt. Db.	100	55	39	40½
3/-	3/-	Madras Elec. 6% Pref. ..	5	5 3/16	84/6	84/6
5%	5%	Do. 5% Deb.	100	100	86	86
7½d.%*	9½d.*	Manaos Trams & Ltg. Ord. ..	1	3/32	4/6	4/6
5%	5%	Do. 5% 1st Deb.	100	77	67½	67½
$1½	$1½	Manila Elec. R. R. & Light ..	$100	102	95½	95
4½%	4½%	Met. Elec. Trams. 4½% Deb. ..	100	85½	73¾	73¾
5%	5%	Do. 5% Deb.	100	87	77½	77½
$1½	$1½	Mexico Trams. Common ..	$100	70	45	45½
5%	5%	Do. 1 Mt. 5% G.B. ..	—	84	60½	60½
—	—	Do. 6% Mt. Bds. ..	100	76	52	52½
4½%	4½%	Montreal Trys. Co. 4½% Stg. Dbs.	100	100	95¾	95¾
4½%	4½%	Do. 4½% Stg. Debs. (1922)	100	99	96	96
2/-	1/2½*	National Steam Car	1	15/32	16/6	17/-
9½d.*	9½d.*	New General Traction	1	½	8/3	8/3
8½d.	6d.	Northern Gen. Trams. Ord. ..	1	4¼	17/3	14/1½
3/-	6/-	Para Elec. Rlys. Ord.	5	4¾	5½	5½
5%	5%	Do. 5% 1st Deb.	100	89½	83	82
—	—	Pernambuco Tram. & Power Ord.	1	—	7/9	7/9
—	8½d.	Do. 7% Non. Cm. Part Pf.	1	—	16/-	16/-
5%	5%	Portland Ry. 5% 1st Mt. 30 yr.	—	96	—	—
8½d.*	8½d.*	Potteries Elec. Trac. Ord. ..	1	15/32	9/9	9/9
3d.	6d.	Do. 5% Pref.	1	15/32	11/10½	11/7½
8d.	1/4	Provincial Trams. Ord. ..	1	¾	19/10½	19/10½
3/-	3/-	Rangoon Tram. 6% Cum. Pref.	5	5½	82/6	82/6
5%	5%	Rhondda Trams. 5% 1 M. Deb.	100	88	79½	79½
5%	5%	Rio de Janeiro Try. & Pr. 1st Mt. 30 yr. 5% Gld. Bd. '35 ..	—	97½	95½	93¾
5%	5%	Do. 1st Mt. 5% 50 yr. ..	100	89½	82	80½
5%	5%	Sao Paulo Deb. 5% 1st Mt. ..	$500	99	94	92½
5%	5%	Do. 5% Perp. Deb. ..	100	99½	79¾	80½
15/-	10/-	Shanghai Elec. Cons.	10	13	14 1/16	14 1/16
3d.	8d.	Singapore Elec. Trams. ..	5/-	¼	4/1	4/1
4%	4%	Sou. Met. Elec. Tram & Ltg. 4% Db	100	66	54	54
5%	5%	S. Elec. Trams. of B.A. 5% Mt. ..	—	100½	99¾	99¾
4½%	4½%	Toronto 1st Mt. 4½% Bds. ..	100	98	94	94½
4½%	4½%	Tramways (M.E.T.) Omnibus 4½% Debs.	100	91	75	75
2/-	2/-	Un'd. El. Tr. Monte Video Ord.	5	4½	47/6	50/-
4½%	4½%	Winnipeg El. 4½% Deb. ..	100	94½	69	69
—	—	Yorks (W.R.) Elec. Trams. Ord.	5	½	27/6	27/6
3/-	3/-	Do. 6% Cum. Pref. ..	5	½	83/9	83/9
4½%	4½%	Do. 4½% 1st Deb.	100	85½	73	73
—	—	Metropolitan Dist. Ord. ..	100	21½	24½	25
—	—	Undgd. Elec. Rys. of London ..	10	21½	65/-	65/-
		Do. "A"	1/-	½	9/1½	9/3
4½%	4½%	Do. 4½% Bds. of 1933 Rd.	—	99	103½	103½
6%	6%	Do. 6% 1st. Cum. In. Db.	100	114	102	103
4%	4%	Do. 6% In. Bonds Rd. ..	—	88	94 15/16	94½

* Indicates dividend for the year. In other cases the dividend is for the half-year.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

Names.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C. ..	Mar. 18	444	516	+ 72	50	25,499	—
Aberdeen Corporation ..	„ 19	2,127	2,578	+ 451	42	108,756	+ 17,687
Ayr Corporation ..	„ 22	352	424	+ 72	44	24,464	+ 5,237
Birkenhead Corporation	„ 23	1,946	2,159	+ 213	51	110,986	+ 16,291
Blackburn „ ..	„ 19	1,474	1,870	+ 396	51½	90,217	+ 14,196
Bradford Corporation ..	„ 15	5,775	9,946	+ 4,171	50	468,243	+ 83,849
Burnley Corporation ..	„ 22	2,080	2,768	+ 688	..	..	..
Burton-on-Trent Cor. ..	„ 23	374	433	+ 59	51	21,058	+ 4,313
Bury Corporation ..	„ 24	1,740	1,967	+ 227	51	103,877	+ 20,080
Chatham & District ..	„ 13	1,186	1,291	+ 105	10	12,197	+ 370
Cork Electric	„ 13	628	518	— 110	10	5,396	— 561
Derby Corporation ..	„ 22	1,306	1,438	+ 132	51	75,937	+ 13,488
Dundee City	„ 19	1,558	2,063	+ 505	44	86,283	+ 17,311
East Ham Corporation ..	„ 22	1,315	1,674	+ 359	50½	79,909	+ 10,694
Glasgow Corporation ..	„ 22	28,130	29,113	+ 983	42½	1,204,468	+ 88,800
Glossop (U.E. Sup. Co.) ..	„ 22	186	224	+ 38	12	2,554	+ 426
Halifax Corporation ..	„ 18	2,310	2,836	+ 526	50½	141,410	+ 19,679
do. Motor Buses ..	„ 18	52	68	+ 16	50½	3,384	+ 890
Huddersfield Corporation	„ 22	3,350	3,657	+ 307	51	184,596	+ 22,883
Ilford U.D. Council ..	„ 22	807	1,043	+ 236	51	51,286	+ 12,366
Ipswich Corporation ..	„ 1	626	666	+ 40	48	35,625	+ 3,899
Isle of Thanet	„ 22	210	344	+ 134	24½	7,700	+ 3,379
Kilmarnock Corporation	„ 22	222	265	+ 43	44½	11,879	+ 2,617
Lanarkshire	„ 13	3,347	3,542	+ 195	10	37,283	+ 4,906
Leeds City	„ 22	11,454	14,312	+ 2,858	51	692,035	+ 131,054
Leicester Corporation ..	„ 22	4,325	5,175	+ 850	..	..	..
Leyton U.D. Council ..	„ 20	1,786	2,659	+ 873	51	121,963	+ 27,340
Liverpool Corporation ..	„ 22	17,296	20,819	+ 3,523	11½	230,608	+ 38,790
Llandudno & Colwyn Bay	„ 14	270	318	+ 48	15	4,405	+ 873
London County Council ..	„ 26	56,073	71,085	+ 15,012	51½	3,428,912	+ 598,497
Maidstone Corporation ..	„ 20	251	279	+ 28	50½	14,376	+ 1,870
Manchester Corporation	„ 22	24,340	27,617	+ 3,277	51	1,336,283	+ 247,536
Newcastle-on-Tyne Cor.	„ 22	8,906	8,487	— 419	51	449,520	+ 44,002
Northampton Cor. ..	„ 21	916	1,123	+ 207	51	45,911	+ 2,498
Nottingham Corporation	„ 20	4,782	6,617	+ 1,835	51	296,572	+ 66,238
Oldham Corporation ..	„ 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation ..	„ 20	1,147	1,330	+ 183	50½	65,998	—
Rhondda Tramways ..	„ 13	1,706	2,119	+ 413	10	21,060	+ 5,086
Rotherham Corporation	„ 19	1,981	2,030	+ 49	50½	114,279	+ 20,926
Sheffield Corporation ..	„ 23	13,712	15,873	+ 2,161	51½	691,354	+ 55,746
Southampton Cor. ..	„ 19	2,262	2,462	+ 200	50½	126,444	+ 20,237
Southend-on-Sea Cor. ..	„ 19	676	1,213	+ 537	50	65,625	+ 22,159
South Shields Cor. ..	„ 15	1,014	1,203	+ 189	50	57,737	+ 9,276
Sunderland Corporation.	„ 23	2,090	2,756	+ 666	51	114,895	+ 18,995
Swindon Corporation	„ 12	294	288	— 6	49½	15,637	+ 1,594
Torquay Tramways ..	„ 13	708	752	+ 44	10	7,300	+ 553
Tyneside Trys. & Trmrds.	„ 5	847	847	+ Nil	10	7,449	— 157
Wallasey Corporation ..	„ 22	1,564	2,024	+ 460	50½	96,032	+ 16,623
Walsall Corporation ..	Feb. 15	1,082	1,202	+ 120	49	57,053	+ 10,850
Walthamstow U.D. Coun.	Mar. 22	1,227	1,423	+ 186	51	72,991	+ 11,382
Warrington Corporation	Feb. 20	744	815	+ 71	47	36,572	+ 8,396
West Ham Corporation	Mar. 20	3,683	4,888	+ 1,205	50½	233,152	+ 47,816
Wigan Corporation ..	Jan. 2	2,354	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

Name.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Mar. 18	£56,612	£64,218	11	£612,348	+ £17,672
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Jan. 5	4,505	4,504	40	35,478	+ 2,167
Brazilian Traction (Mlrs.)	Dec.	8,069,000	8,531,000	52	101,894,000	+ 9,694,000
Brisbane	Feb.	32,009	34,580	8	72,955	+ 6,446
British Columbia .. $	Jan.	559,569	677,489	30	4,095,584	+ 612,355
Buenos Aires Lacroze ..	Feb.	34,397	42,429	34	343,209	+ 39,434
Burnlah Tram. & Light Rs.	Jan.	25,430	38,265	26	214,804	+ 53,554
Calcutta .. .. Rs.	Mar. 8	77,376	90,051	9½	836,619	+ 131,232
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Feb.	2,031	2,351	8	6,006	— 2,036
Cordoba	Jan.	12,844	13,942	44	145,654	+ 10,915
East India	Feb.	1,318	1,689	30	13,612	+ 4,845
Hong Kong .. .. $	Feb. 1	12,905	17,349	5	70,893	+ 9,786
Kalgoorlie	Nov.	2,641	2,933	48	30,838	+ 1,274
La Plata	Feb.	4,746	5,698	8	11,428	+ 1,971
Lima	Dec.	43,198	47,887	52	527,839	+ 87,587
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Feb. 28	33,553	35,254	6	166,609	+ 17,415
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	+ 83,959
Manila .. .. $	Jan.	167,000	231,585	4	231,585	+ 64,585
Montevideo	Feb.	34,573	38,772	17	149,821	+ 14,147
Para	Jan.	24,060	24,515	8	48,315	+ 940
Pernambuco	Mar. 23	4,615	5,281	11	62,159	+ 6,116
Peruvian .. .. $	Feb.	925,410	943,470	34	7,973,835	— 229,195
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Feb.	5,062	5,694	8	12,067	+ 1,044
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,208
Singapore .. .. $	Feb. 1	13,181	16,852	5	77,240	+ 15,663
Toronto .. .. $	Jan.	1,068,319	1,106,840	4	1,106,840	+ 38,521
Winnipeg .. .. $	Jan.	334,642	390,539	4	390,539	+ 55,897

WANTED.

COPIES OF "THE TRAMWAY AND RAILWAY WORLD."

Issues of January 1 and 13, 1916, and August 16 and October 18, 1917, to complete files for binding.

Indexes to Vols. XI (Jan. to June, 1902), XIII (Jan. to June, 1903), and XXXVIII (Jan. to June, 1915).

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THE
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SATURDAY, APRIL 5, 1919.

SCOPE FOR PUBLICITY.

USEFUL work in making known various traffic facilities has been accomplished by the London County Council Tramways Department during the past two years, though the shortage of paper has temporarily brought about the discontinuance of the monthly circular and map. In other directions there are now strong inducements to utilise the publicity afforded by the Press. The need exists for enlightening the public upon the difficulty of putting more cars in service, particularly from the point of view of obtaining materials and the return of men from the Army. The Bill to secure Parliamentary sanction this year for linking up the Southern and Northern lines is a subject that especially lends itself to treatment. Two points in particular need to be pressed upon public attention First, there is the fact that the project received the sanction of the electors at the recent triennial election, following its acceptance by the Council with only two dissentients—the behind-the-age representatives of the City. Another consideration is that the linking up will relieve the congestion at the Blackfriars queues, where thousands of workers have to endure tedious waits, often in wet weather, without shelter. Attention might also be given to dispelling the contention that tramways across Ludgate Circus will obstruct other vehicles. In the early morning, when the cars will bring the incoming rush, other traffic is practically non-existent, and the same remark is applicable to the evening departures, save that omnibuses are also engaged on the same work. In future there will be even less industrial traffic than at present, for the shorter working day for drivers will have come into operation. Not less necessary is the need for making known to tramway passengers the justification of the higher fares which will have to be imposed in order to meet the cost of granting the eight-hour day to the tramway employees. The Highways Committee have estimated that this concession will add £320,000 to the working expenses. Another task that the publicity department ought to take up is the creation of a civic spirit among Londoners. They must have it made clear to them that every penny diverted from their own cars brings nearer the day of yet higher fares, and after that a tramway rate and increased rents in the cases of those whose payment of rates is included in their rent.

EFFECT OF CONCESSIONS TO EMPLOYEES.

The Municipal Tramways Association, in view of the new agreement with the employees throughout the country providing for a 48-hour working week, have decided to approach the Government for the necessary powers to increase tramway fares. It is estimated that the new arrangement will impose an additional charge on the London County Council tramways of £360,000 a year, and the wages bill of other tramway undertakings will be increased proportionately.

Birmingham tramway service has not suffered from the transition from the 54-hour to the 48-hour week, though at least 200 men will have to be added to the staff in order to meet the new conditions. At present, the men complain that owing to the traffic requirements they are unable to do their eight hours without a break, and in some instances it has taken as much as 17 hours for them to work their turns. "Birmingham," said Mr. J. Crump, of the Amalgamated Association of Tramway and Vehicle Workers, "is the only city where such heavy traffic both morning and night requires all the available men to work the service." But it is hoped that arrangements will be made so that in future the men can do their eight hours in at least twelve."

The agreement arranged between representatives of the Municipal Tramways Conference, the Tramways and Light Railways Association, and the National Transport Workers' Federation, under which tramway employees are to work a 48-hours week, came into operation in Burnley on March 26. It is estimated that the introduction of this system will involve an increase in the expenditure of the Burnley tramway department of about £10,000 per annum. The changes are so far-reaching in effect that a considerable time must elapse before the conditions of the agreement can be fully applied.

At a conference between the Bradford Tramways Committee and representatives of the employees, details were discussed in connection with the 48-hour week granted to tramway employees throughout the country. The existing rates of pay will continue, and it has been arranged that a limited amount of overtime should be worked where necessary, to be paid for at overtime rates.

At Coventry Town Council meeting, Mr. Wale moved the adoption of a recommendation from the Tramways Committee : "That application be made to the Board of Trade for their consent, under the Statutory Undertakings (Temporary Increase of Charges) Act, 1918, to an increase in the scale of charges not exceeding 50 per cent. above the existing statutory rates ; and that, subject to such consent, a new scale of charges be adopted." Mr. Wale referred to the increases in wages which had been initiated by the Government and the Transport Workers' Federation. The position was that in the current year the increased wages of £2,250 were not included in the accounts, and owing to the increased amount of £9,750 decided upon by the Government and transport workers their wage bill in 15 months would be increased by £12,000. They proposed to increase as far as they legitimately could their charges 50 per cent.—the maximum allowed by the Act. They proposed to do it in a way that would cause little inconvenience. He hoped they would secure the consent of the Board of Trade, or next year the ratepayers would be saddled with a charge of something like £12,000. Mr. F. Lee seconded the resolution, which was carried.

Six additional members of the Exeter Town Council have been appointed to confer with the Tramways Committee in regard to the proposed increase in the scale of fares. It has been decided to rearrange the fares so as to produce a larger income.

Birkenhead Corporation do not propose at present to increase the fares. Owing to the 48-hour week coming into operation, it has been necessary to increase the staff, but the Tramways Committee hope to avoid the necessity of alteration in fares.

Now that the 48-hour week is in operation, the Aberdeen Tramways Committee, like many others, are faced with a difficult financial problem. It has been estimated that there will soon be a deficit at the rate of from £500 to £600 a year in spite of the increased revenue. Halfpenny fares have always resulted in a loss, and it is possible that they will have to be abandoned. Hitherto the average length of the halfpenny stage has been 1,025 yards and the average distance a passenger could travel for a penny was 1,716 yards.

It is estimated that the additional cost of the new arrangement to the Brighton Tramways Committee will amount to about £8,000 a year. The working week has been 60 hours, and this is now to be reduced to 48, with pay as for 57 hours.

Derby Tramways Committee propose to increase the fares, making the minimum for adults, except on workmen's cars, 1½d., and for children over three and under twelve 1d. All the penny fares will thus be abolished for adults, with the exception of the workmen's fares.

Blackpool Tramways Purchase.—The Corporation of Blackpool and the Fleetwood Council have agreed upon terms which will enable Fleetwood to exercise its option to purchase the portion of the Blackpool and Fleetwood tramroad in its district within a certain number of years. In the meantime Blackpool Corporation will acquire the whole undertaking and work it in connection with their system, thus giving a through route to Fleetwood.

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L.C.C. TRAMWAY ACCOUNTS.

THE YEAR ENDED MARCH 31, 1918.

A meeting of the London County Council on April 1 received and adopted the accounts submitted by the Highways Committee for the year ended March 31, 1918, together with a report by the general manager on the working of the undertaking.

The tramways system on March 31, 1918, extended over a total length of 149 street miles, of which 144½ miles were electric lines and 4·6 miles disused horse lines.

The following table gives the total income from the undertaking during the year, and the working expenses compared with the results in the four preceding years are given below :—

YEAR ENDED MARCH 31	1918	1917	1916	1915	1914
	£	£	£	£	£
Income	2,932,140	2,552,203	2,339,291	2,399,487	2,268,669
Working expenses * ..	2,128,686	1,817,694	1,683,660	1,700,212	1,615,467
Surplus on working ..	803,454	734,509	655,631	699,275	653,202
Deductions—					
Debt charges—					
Interest	293,568	314,164	326,477	330,300	--
Redemption ..	428,319	429,851	425,908	405,605	—
	721,888	744,015	752,385	735,905	736,602
Rent drawbacks, etc.	—	7,551	6,797	1	—
Income tax, etc. ..	75,661	73,000	40,000	32,102	28,197
Parliamentary expenses ..	—	18	2,260	2,803	2,082
Amount due under through-running agreements ..	--	1,528	--	--	—
	797,549	826,112	801,442	770,811	766,881
Less tax deducted, interest on cash balances, rents, etc. ..	89,654	102,945	72,061	38,363	25,153
Total deductions from surplus	707,895	723,167	729,426	732,448	741,728
Balance	£95,559 (Surplus)	11,342 (Surplus)	73,795 (Deficiency)	33,173 (Deficiency)	88,526 (Deficiency)

* Includes war service allowances, 1917-18, £119,432; 1916-17, £110,155; 1915-16, £95,365; 1914-15, £42,209.

The total number of passengers carried during the year was 593,516,141; the number of car miles run was 49,189,866. The corresponding figures for 1916-17 were 586,127,976 and 49,478,973.

The operating expenses were £2,002,200 (excluding war service allowances of £119,432 4s. 7d., and certain special charges amounting to £7,053 1s. 5d.).

The capital expenditure on the undertaking up to March 31, 1918, amounted to £13,659,588 19s. 4d., of which £89,469 17s. 5d. represents expenditure during the year 1917-18.

The amount of the debt incurred up to March 31, 1918, was £13,988,671 19s. 4d. The net debt on March 31, 1918, *i.e.*, the debt outstanding, after allowing for debt repaid out of revenue and sinking fund balances and for £120,216 in respect of the value of surplus land, was £8,764,004 8s.

The amount charged to the tramways revenue account during the year 1917-18 in respect of rates on tracks (£65,180) and debt charges on street improvements (£36,040), together with the estimated saving to local authorities on maintenance of paving (£184,000), gives a total of £285,220, and various rates were therefore relieved to this extent.

NEW CHAIRMAN OF HIGHWAYS COMMITTEE.

The Highways Committee reported that they had elected Mr. W. J. Squires as their representative on the General Purposes Committee, and Capt. A. O. Goodrich as their representative on the Stores and Contracts Committee.

48-HOUR WEEK.

The Highways Committee reported that they propose at once to give the most careful consideration to the effect of the heavy charge that will be imposed on the tramway undertaking as a consequence of the agreement arrived at on March 20, 1919, between the representatives of the Municipal Tramways Conference, the Tramways and Light Railways Association, and the National Transport Workers' Federation (the full text of this was given in our last issue). The agreement affects the major portion of the operating staff of the Council's tramways, and took effect on March 27. It is estimated that the additional wages to be paid under this agreement will amount to £4,000 for the remainder of the current financial year, and for a full year at £360,000. The Finance Committee, commenting on the matter, stated that the Council could not but agree to the increased additional expenditure, but they desire to point out the very large additional charge that would be imposed on the tramways undertaking.

CENTRAL CAR REPAIR DEPOT.

The Highways Committee recommend that tenders from selected firms for the piling and foundations, and the constructional steelwork required for the erection of the final portion of the central car repair depot should be approved.

THE TRANSPORT BILL AND THE GOVERNMENT'S DETERMINATION.

The Ministry of Ways and Communications Bill has been under consideration during the week by the Standing Committee B of the House of Commons. The Government have in general taken a very firm stand, and Mr. Bonar Law has repeatedly stated that they feel that the Bill is an integral part of their policy for plans of reconstruction, and they cannot accept any fundamental change in the measure. In particular the Government decline to accept proposals for consultative committees with statutory powers, but they are willing to give the Minister-designate powers to appoint advisory committees.

On Wednesday the House, after a long discussion, agreed to the Money Resolution. This, among other things, authorised the payment of an annual salary not exceeding £5,000 to the Minister of Ways and Communications, and salaries not exceeding £1,500 to the Parliamentary Secretaries of the Ministry, and such other salaries and expenses as may become payable under the Act, also such sums as may be required to fulfil any guarantee, to make contributions to pension or superannuation funds, and to make advances and other payments authorised under the Act.

Good progress has been made this week by the Standing Committee B. The Government declined to accept the proposal that the control of the roads should be omitted from the Bill, and they were supported by a majority of the Committee. On Thursday many speakers advocated the exclusion of the docks from the scheme, but Mr. Shortt said that the Government and their advisers had gone very carefully into the whole question, and they had come to the conclusion that it was an absolutely essential portion of the scheme, and that it would be idle to take over the control of the roads and railways unless they took the docks. On a division the amendment was rejected by 32 votes to 15. A proposal to omit the clauses dealing with the supply of electricity was under discussion when the Committee adjourned until Tuesday next.

A proposal to leave out tramways from the operation of Clause 2 was negatived. Mr. Shortt said that the powers taken over would be exactly those which were now exercised by the Board of Trade, namely, inspection rules to ensure public safety, etc. The Committee also declined to leave out light railways. In regard to these lines, Mr. Shortt stated that the Ministry would discuss the best form of light railways, and the positions where they would be placed. Light railways were an integral part of the means of transport, and were necessary for the industrial life of the country.

MISCELLANEOUS NEWS AND NOTES.

British Firms Only.—The Southwark Board of Guardians have agreed to consider tenders from British firms only, and all firms tendering are to be requested to state the names of their principals.

Incorporated Municipal Electrical Association.—The annual convention will be held this year at Felixstowe from June 17th to 19th. The convention is on this occasion being restricted to members of the Association, owing to limited accommodation.

Tramway Strike at Melbourne.—Melbourne tramway workers struck work on March 7, but on an agreement being reached that the dispute should be referred to the Victorian Premier as arbitrator they agreed to resume work on March 22.

Exeter-Torquay Motor Omnibus Service.—Pending the receipt of more precise information, the Exeter Tramways Committee have deferred making recommendations in regard to the running by a company of a motor omnibus service between Exeter and Torquay.

Light Railways in Mansfield District.—Mansfield and District Light Railway Company have submitted an application to the Light Railway Commissioners for authority to construct various extensions.

Iron and Steel Institute.—The annual meeting will be held on May 8th and 9th at the Institution of Civil Engineers, Great George Street, S.W., when a number of papers will be read and discussed. To celebrate the jubilee of the foundation of the Institute the annual dinner will this year be held at the Guildhall.

Chilian Railway Electrification.—It is reported that the Chilian State Railway authorities are considering the electrification of the railway from Valparaiso to Santiago, a distance of 116 miles. Two prominent engineers, Rafael Edwardes and Ricardo Solar are investigating the question.

Sunday Service on the Tees-side.—Having failed to secure the resumption of the Sunday service on the Tees-side, the local committee of the Iron, Steel, and Kindred Trades Association have passed a resolution refusing to work on Sunday unless the tramway cars are run for the workmen.

Tramway Extensions at Wemyss Bay.—A scheme is being discussed for linking up Wemyss Bay and Largs by an electric tramway. The distance is about ten miles, and as the roadway is practically level throughout, the route is well adapted to tramway construction.

Heavy Snowfall in London.—On Saturday morning, March 29th, there was a heavy fall of snow, which at daybreak lay on the ground to a depth of six or seven inches. A number of suburban tramway lines were blocked for a short time, but in most cases the snow was quickly cleared away.

Fatal Accident on Edinburgh Tramways.—A fatal accident took place at the Shrubhill depot of the Edinburgh Tramways Company on March 26th. Robert Wilson, an engineer, who had gone into the cable pit, became entangled in the spokes of the pulley and was crushed against the wall.

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New Cars for Wallasey.—Wallasey Tramways Committee are arranging for the purchase of ten new cars at a cost of £20,600, but they have postponed a decision of the question of obtaining motor omnibuses for six months. The Council hope they may then be able to obtain the vehicles at a lower price.

North Devon Light Railway Scheme.—Black Torrington Council has unanimously asked the Devon County Main Roads and Bridges Committee to promote the construction of a light railway from Hilwill Junction to Great Torrington. This line would open up a large district hitherto untouched by railway communication, and would take an enormous amount of heavy traffic off the roads.

Institution of Electrical Engineers.—M. R. J. Kaula will read a paper on "Notes on Surface Condensing Plants, with Special Reference to the Requirements of Large Power Stations," before the Institution of Electrical Engineers, at the Institution of Civil Engineers, Great George Street, S.W., on Thursday, April 10th, at 6 p.m.

Leyland Old Bus Chassis Sells for Over £500.—As evidence of the high prices that are at present commanded by industrial motor vehicle chassis of the best makes, it is interesting to note that at a recent sale conducted on behalf of the Government Stores Disposal Board at the Agricultural Hall, a Leyland omnibus chassis dated 1914 which was not in the best of condition, realised five hundred and eighty guineas.

Proposed Light Railways in Essex.—A Special Committee of the Essex County Council is considering schemes for rural development. Among other recommendations, the Committee urges that the Government should undertake a survey with a view to the construction of light railways and the establishment of a better system of water transport. The Committee considers that there is undoubtedly room for great development.

British Locomotives in France.—Captain Guest stated in the House of Commons recently that 423 locomotives owned by British railway companies are still retained in France, and 36 locomotives have been returned. The remainder are being returned as they can be released and as speedily as Channel facilities permit. There are in addition 786 locomotives in France which are the property of the War Department.

Special Service at Special Fares.—Newcastle Tramways Committee have made arrangements to run special cars to meet the 11.30 p.m. train arriving from London. A special charge will be made for those who wish to travel on these cars. The Tramways Committee propose to entertain the auxiliary tramway workers at a social gathering, in order that the Committee may express their appreciation of the work done by these men during the war.

Vestibules on Tramcars.—At the meeting of the Estates, Public Works, and Tramways Committee, of Stoke-on-Trent Borough Council, the Town Clerk submitted a resolution of the N.S. Trades and Labour Council, calling upon the Potteries Electric Traction Company to provide vestibules on all tramcars on their services, and asking for the Council's support. It was resolved that this committee support the action of the Trades and Labour Council, and urges the P.E.T. Company to provide such vestibules at the earliest possible moment.

Joint Industrial Council.—Alderman Flint, chairman of the Leicester Corporation Tramways Committee, at a recent meeting of the Council referred to the formation of the Joint Industrial Council for the Tramway Industry, the Constitution of which was given in full in our issue of March 13, 1919. All the tramway companies, said Alderman Flint, had fallen into line in the matter. There would be representative district committees and if a difficulty arose which only affected Leicester, then the representatives of that undertaking and their employees would endeavour to settle it. If they could not do so, it would then have to go to the Council for the area, and, if they failed to agree, then to the National body. The main idea was to prevent friction.

Yorkshire and District Tramway Managers' Association.—A meeting of the Yorkshire and District Managers was held at Doncaster on Tuesday, March 25th, 1919. The following members were present: Messrs. E. S. Rayner (Doncaster), R. H. Wilkinson (Bradford), H. Jagger (Rotherham), W. E. Nicoll (Barnsley), J. V. Moinet (Scarborough), A. A. Blackburn (Huddersfield), J. W. Hame (York), H. England (Wakefield), E. A. Paris (Yorkshire Woollen District), H. L. White (Grimsby), and H. Webber (Keighley). The members lunched together at the Danum Hotel, and afterwards adjourned to the car sheds and there inspected the car that had been equipped with top-deck seats invented by Mr. Rayner. A meeting was afterwards held in the tramway offices, at which the agreement recently made between the Tramways Association and the Transport Federation was discussed.

Conduit or Overhead System for Edinburgh.—The question whether the conduit system or the overhead trolley system should be installed in Princes Street is a question which is being keenly debated by the Edinburgh Tramways Committee. Opinion among the deputation, which visited London and Bournemouth recently, is divided between the two systems. Mr. Pilcher, the general manager, has in the meantime drawn up another report on the question of the system of traction for Princes Street, and in this he reiterates his objections to the conduit system. He points out that the cost of providing pointsmen at the several junction points in Princes Street would be not less than £800 per annum, and he also emphasises the greater risk of breakdowns owing to the climatic conditions than with the overhead system. The Sub-Committee of the Tramways Committee have drawn up a report, non-committal in character, making no definite recommendations.

Women Tramway Employees at Glasgow.—Between 3,000 and 4,000 of the employees of the Glasgow Corporation tramways have served with the Forces during the war. Recently men have been demobilised at the rate of about fifty weekly, and to reinstate these men in their former situations women have been released from the duties of motor drivers, and have taken up those of conductors. The women more recently added to the staff have been dismissed, but there are still about 1,500 women in the tramway service.

Army Motors From Egypt.—In the House of Commons, Captain Ormesby-Gore asked how the surplus motor transport vehicles, staff cars, and transport animals of the Egyptian Expeditionary Force will be disposed of, when no longer required for military purposes, and whether they will be sold locally or shipped home? Mr. Hope replied that, as and when motor vehicles and staff cars become surplus to military requirements, the representative of the Disposal Board with the Egyptian Expeditionary Force will advise the Board as to how many should be sold locally and how many shipped home for sale. All sales will be fully advertised, so that all persons interested may have an opportunity of purchasing.

Tram Conductor's Responsibility.—At an inquest on a man of 74, who jumped off an omnibus before it had stopped, and was killed by being struck by a motor car, the coroner for North Worcestershire said that no blame attached to anyone, but the conductor ought to exercise discretion in looking after passengers. The conductor, in his evidence, had said that they were not supposed to hold back people if they wished to jump off. One of the officials said that they encouraged their conductors to caution any member of the public, who might stand on the platform, not to attempt to jump off before the vehicle came to a standstill. At the same time, they could hardly forcibly restrain any passenger who might wish to take the risk in jumping off. If they did so, they might be summoned for assault. If passengers deliberately disregarded warnings, they must take the consequences.

Wages Difficulty at Edinburgh.—The claim of the employees of the Edinburgh and District Tramways Company to have put in force the agreement arrived at on March 20th between the representatives of the Municipal Tramways Conference, the Tramways and Light Railways Association, and the National Transport Federation has given rise to difficulty. A letter was sent by the general manager to the employees stating that the company had notified the secretary of the Tramways and Light Railways Association that they would not be a party to any agreement arrived at, and that owing to the existing state of affairs the company could not make any further concession unless they had power to increase their fares. On receipt, the employees resolved to call upon the general secretary to take such steps as were necessary to guarantee to the Edinburgh members the terms of the agreement, and failing the receipt of a satisfactory reply the members decided to withdraw their labour on the evening of Sunday next. A copy of the resolution was sent to the general manager, who replied that he had sent all the correspondence to the Board of Trade, and had requested them to take such action as would prevent a strike by giving the company power to increase the fares. The company has about 1,000 employees, and it was estimated that the concession would mean a weekly increase in the wages bill of £400. The company's lease expires on June 30th, when the undertaking will be worked by the Corporation.

BUSINESS NOTICES.

The General Vehicle Co., Ltd., have removed their offices to larger premises at Pontifex House, 43, Shoe Lane, London, E.C.

George Spencer, Moulton and Co., Ltd.—Owing to the amalgamation of this company with Messrs. Wood-Milne, Ltd., the headquarters of the solid tire department have been transferred from 239, Deansgate, Manchester, to 42, Wigmore Street, London, W.1, to which all communications hitherto sent to 239, Deansgate, Manchester, should be addressed.

THE
ENGLISH ELECTRIC COMPANY
LIMITED.

Abchurch Yard, Cannon Street, London, E.C.4.

This Company, with a Capital of £5,000,000, has been formed to consolidate under one direction and management the various interests of the following companies, in all of which a predominating control exists:—

COVENTRY ORDNANCE WORKS, LTD.
DICK, KERR & CO., LTD.
PHŒNIX DYNAMO MANUFACTURING CO., LTD.
UNITED ELECTRIC CAR CO., LTD.
WILLANS & ROBINSON, LTD.

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PERSONAL.

Mr. H. E. Stilgoe, city engineer and surveyor of Birmingham, has been appointed engineer of the Metropolitan Water Board.

Mr. John Moulds has been appointed assistant to the electrical engineer of Leicester, at a salary of £500 per annum.

Mr. Roger T. Smith, electrical engineer of the Great Western Railway, has been nominated by the Council of the Institution of Electrical Engineers for election as President.

Mr. W. A. Jones has resigned the position of charge engineer of Leyton Council on his acceptance of the post of general secretary of the Electrical Power Engineers' Association.

Mr. H. E. Ellis, borough electrical engineer of South Shields, has been appointed chief electrical engineer of Southampton Corporation.

Mr. W. T. Robson, tramways manager and engineer of Southampton Corporation, has been granted an increase in salary from £500 to £700 a year.

Mr. W. J. Squires has been appointed chairman, and **Lieutenant-Commander A. Cooper Rawson** vice-chairman of the Highways Committee of the London County Council.

Sir Auckland Geddes, Minister of National Service and Reconstruction, has resigned in order to accept the presidency of McGill University, Montreal, where he was Professor of Astronomy previous to the outbreak of war.

Mr. J. A. Raworth has been joined in partnership by Mr. Ernest W. Moss, who was for some years chief assistant to the late Dr. S. P. Thompson. He was also assistant to Mr. H. M. Hobart. The new firm will be called Messrs. J. A. Raworth and Moss, with head offices at Queen Anne's Chambers, S.W.

FINANCIAL.

Lanarkshire Tramways Company.—A dividend of 11s. per share is announced for the second half of 1918. For the first half the company paid 7 per cent., and the total distribution for the year is thus 9 per cent. Due provision has been made for upkeep and depreciation.

L.C.C. Traffic Receipts.—The traffic receipts for the 5 days ended Mar. 31 (completing the financial year) amounted to £50,235, an increase of £9,397 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to March 31 (fifty-two weeks) the total receipts were £3,479,154, an increase of £613,465 on the corresponding period of 1918.

Bristol Tramways and Carriage Co.—The revenue of the Bristol Tramways and Carriage Company for 1918 amounted to £749,873 and the expenses and renewals to £634,776, making, with the balance brought forward, a net balance of £133,249, as compared with £124,242 for 1917. The dividend is to be further advanced from 6¼ to 7 per cent., free of tax, and £40,000 as against £30,000, is to be added to the reserve for contingencies and renewals. The reserve now amounts to £471,413. The receipts of the tramway department decreased £467, while those of the carriage department increased £105, 670.

Liverpool Corporation Tramways.—The report of the general manager, Mr. C. W. Mallins, for the year ended December 31, 1918, shows improved results, as compared with those of last year

	1918.	1917.
Total revenue	£989,504	845,645
Operating costs	716,479	575,267
Gross profit	273,025	270,378
Net profit	273,025	167,243

Since the tramways undertaking came into the hands of the municipality, the total contribution to the relief of the rates has been £1,062,899. The 1918 traffic returns, with the comparative figures for the preceding year, are as under:—

	1918.	1917.
Passengers..	195,082,609 ..	172,842,494
Receipts	£962,539 ..	£818,756
Earnings per car mile	18·091d. ..	15·059d

Thornycroft and Co., Ltd., have an order from the Southampton Corporation Tramways for a motor chassis. The machine is the firm's "J" type, fitted with a 40 h.-p. engine, and constructed to carry a gross load of four tons.

The British Westinghouse Electric and Manufacturing Co., Ltd., have issued an artistic calendar for the twelve months ending March 31, 1920.

BINDING CASES

For half-yearly volumes of "The Tramway and Railway World" can be obtained from the Publishers, price **3s.**

READING CASES

To hold 26 Saturday Issues can be supplied at **3s. 6d.**

These cases are strongly bound and form a convenient means for filing copies for reference until the half-yearly volumes are completed.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C. ..	Mar. 25	497	490	— 7	51	25,989	—
Aberdeen Corporation ..	" 26	2,257	2,546	+ 289	43	111,302	+ 17,976
Ayr Corporation ..	" 29	366	422	+ 56	45	24,886	+ 5,293
Birkenhead Corporation	" 30	1,959	2,243	+ 284	52	113,229	+ 16,542
Blackburn " ..	" 25	1,601	1,881	+ 280	52	91,743	+ 14,274
Bradford Corporation ..	" 22	4,986	9,325	+ 4,339	51	472,568	+ 88,188
Burnley Corporation ..	" 29	2,444	2,729	+ 285	..	..	..
Burton-on-Trent Cor. ..	" 30	383	405	+ 22	50	21,463	+ 4,334
Bury Corporation ..	" 30	1,981	1,962	— 19	52	106,115	+ 20,338
Chatham & District ..	" 30	1,164	1,273	+ 109	11	13,470	+ 1,479
Cork Electric	" 20	655	578	— 77	11	5,975	— 1,637
Derby Corporation ..	" 29	1,3.6	1,448	+ 92	52	77,385	+ 13,581
Dundee City	" 26	1,632	2,024	+ 392	45	88,307	+ 17,704
East Ham Corporation ..	" 29	1,404	1,688	+ 284	51½	81,597	+ 10,978
Glasgow Corporation ..	" 29	27,691	29,789	+ 2,098	43¼	1,234,257	+ 89,708
Glossop (U.E. Sup. Co.) ..	" 29	204	208	+ 4	13	2,763	+ 431
Halifax Corporation ..	" 25	2,648	2,495	— 153	51½	143,905	+ 19,525
do. Motor Buses ..	" 25	56	56	Nil	51½	3,441	+ 890
Huddersfield Corporation	" 29	3,307	3,796	+ 489	52	188,393	+ 23,373
Ilford U.D. Council ..	" 29	839	1,047	+ 208	52	52,590	+ 12,551
Ipswich Corporation ..	" 1	626	666	+ 40	48	36,625	+ 3,899
Isle of Thanet ..	" 29	218	343	+ 125	25½	8,044	+ 2,504
Kilmarnock Corporation	" 29	235	264	+ 29	45¾	12,144	+ 2,646
Lanarkshire	" 20	3,457	3,706	+ 249	11	40,989	+ 5,155
Leeds City	" 29	11,454	14,312	+ 2,858	52	692,075	+ 131,064
Leicester Corporation ..	" 29	4,436	5,148	+ 712	..	..	..
Leyton U.D. Council ..	" 27	1,921	2,636	+ 715	52	124,599	+ 29,261
Liverpool Corporation ..	" 29	17,198	21,698	+ 4,500	12½	252,307	+ 43,291
Llandudno & Colwyn Bay	" 14	270	318	+ 48	15	4,405	+ 873
London County Council ..	" 31	40,838	50,235	+ 9,397	52	3,479,154	+ 613,465
Maidstone Corporation ..	" 27	263	274	+ 11	51½	14,651	+ 1,891
Manchester Corporation	" 29	24,365	27,650	+ 3,285	52	1,363,933	+ 250,298
Newcastle-on-Tyne Cor.	" 29	8,805	8,478	— 327	52	457,998	+ 43,520
Northampton Cor. ..	" 21	916	1,123	+ 207	51	45,911	+ 2,498
Nottingham Corporation	" 27	5,150	6,611	+ 1,461	52	303,184	+ 67,700
Oldham Corporation ..	" 5	2,602	2,600	— 2	41	141,684	+ 25,756
Reading Corporation ..	" 27	1,253	1,339	+ 86	51½	67,336	—
Rhondda Tramways ..	" 20	1,633	2,150	+ 517	11	23,210	+ 5,603
Rotherham Corporation	Apr. 1	2,1[illegible]8	2,119	— 49	52	118,397	+ 20,829
Sheffield Corporation ..	Mar. 30	12,784	16,072	+ 3,288	½	11,286	+ 2,381
Southampton Cor. ..	" 26	2,362	2,407	+ 45	51¾	128,851	+ 20,283
Southend-on-Sea Cor. ..	" 26	707	1,145	+ 438	51	66,771	+ 22,597
South Shields Cor. ..	" 15	1,014	1,203	+ 189	50	57,737	+ 9,276
Sunderland Corporation..	" 30	2,020	2,694	+ 674	52	117,589	+ 19,668
Swindon Corporation .	" 26	301	264	— 37	51¾	15,687	+ 1,467
Torquay Tramways .	" 20	721	814	+ 93	11	8,114	+ 646
Tyneside Trys. & Trmrds.	" 5	847	847	+ Nil	10	7,449	— 157
Wallasey Corporation .	" 29	1,648	2,040	+ 392	52	98,072	+ 17,016
Walsall Corporation ..	" 29	1,387	1,310	— 77	52	64,626	+ 11,509
Walthamstow U.D. Coun.	" 29	1,321	1,440	+ 119	52	74,431	+ 11,455
Warrington Corporation	Feb. 20	725	851	+ 126	51	39,949	+ 8,793
West Ham Corporation	Mar. 27	3,905	4,813	+ 907	51½	237,964	+ 48,723
Wigan Corporation .	Jan. 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Mar. 25	£56,890	£62,116	12	£674,459	+ £22,898
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Jan. 5	4,505	4,504	40	35,478	+ 2,167
Brazilian Traction (Mlrs.)	Jan.	7,837,000	8,522,000	4	8,522,000	+ 685,000
Brisbane	Feb.	32,009	34,380	8	72,955	+ 6,446
British Columbia .. $	Jan.	559,569	677,489	30	4,095,584	+ 612,355
Buenos Aires Lacroze ..	Feb.	34,397	42,429	34	343,209	+ 39,434
Burmah Tram. & Light Rs.	Feb.	22,985	35,926	30	250,730	+ 66,495
Calcutta .. .. Rs.	Mar. 22	72,593	82,752	11½	1,008,221	+ 154,037
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Mar.	5,316	2,400	13	8,406	— 4,952
Cordoba	Jan.	12,844	13,942	44	145,654	+ 10,915
East India	Feb.	1,318	1,689	30	13,612	+ 4,845
Hong Kong.. .. $	Feb. 1	12,905	17,349	5	70,893	+ 9,786
Kalgoorlie	Nov.	2,641	2,933	48	30,838	+ 1,274
La Plata	Feb.	4,746	5,698	8	11,428	+ 1,971
Lima	Dec.	43,198	47,887	52	527,839	+ 87,587
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Feb. 28	33,553	35,254	6	166,609	+ 17,415
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	+ 83,959
Manila .. .. $	Jan.	167,000	231,585	4	231,585	+ 64,585
Montevideo	Feb.	34,573	38,772	17	149,821	+ 14,147
Para	Jan.	24,060	24,515	8	48,315	+ 940
Pernambuco	Mar. 30	4,341	5,563	12½	67,722	+ 7,338
Peruvian .. .. $	Feb.	925,410	943,470	34	7,973,835	— 229,195
Port Elizabeth	Nov.	3,807	3,198	...	...	...
Rangoon	Feb.	5,662	5,694	8	12,067	+ 1,044
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore .. .. $	Feb. 1	13,181	16,852	5	77,240	+ 15,663
Toronto .. .. $	Jan.	1,068,319	1,106,840	4	1,106,840	+ 38,521
Winnipeg .. .. $	Jan.	334,642	390,539	4	390,539	+ 55,897

WANTED.

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THE Tramway & Railway World
WITH MOTOR TRAFFIC SECTION

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WHITE BAY POWER STATION OF THE NEW SOUTH WALES RAILWAYS.

A PAPER READ BEFORE THE ELECTRICAL ASSOCIATION OF AUSTRALIA

By O. W. BRAIN, M.I.E.E. (*Chief Electrical Engineer*).

The New South Wales Railway Commissioners' Metropolitan electric power supply, while providing the traction current for the Sydney tramways, also furnishes electric power for the railway and tramway workshops, and the numerous auxiliary services of the department throughout the metropolis, including the signalling system, elevators, conveyors, lifts, pumps, air compressors, etc. The Commissioners' lighting load in the city and suburbs is considerable, and in addition there is quite a substantial output to other Government departments for the sewerage services, swing bridges, etc.

The area covered by the Sydney Electric Tramways is shown in Fig. 2, on which the tracks are drawn in continuous lines. As a matter of interest, the Melbourne cable tramways are shown by broken lines superposed. The scale is indicated by concentric circles, a mile apart, the Post Office being the centre.

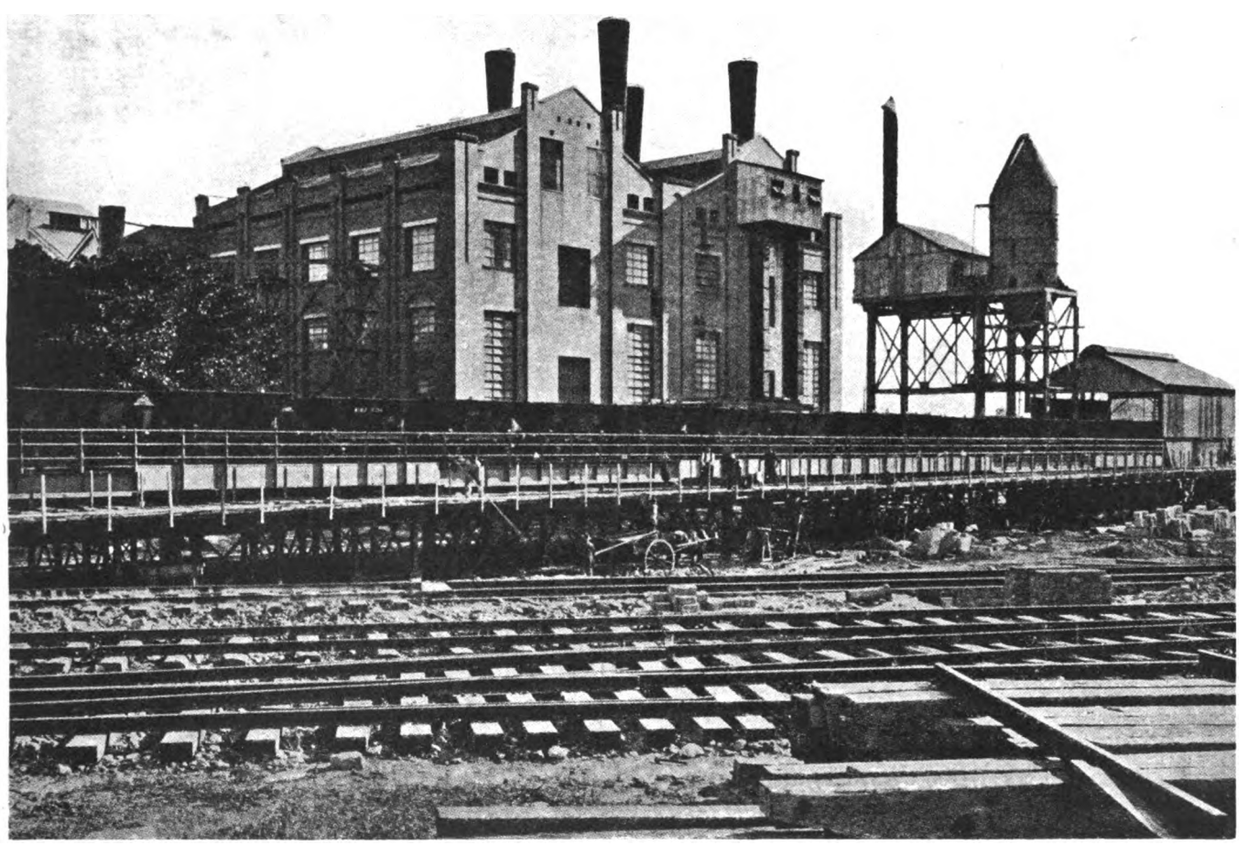

Fig. 1.—White Bay Power Station, Sydney, New South Wales, showing Elevated Railway Tracks and Pneumatic Ash Plant.

The continuous ratings of the seven turbo-alternators now installed in the Ultimo Power-house aggregate 36,000 KW., while the total evaporative capacity of the sixty water tube boilers is 580,000 lb. water per hour. The effort to utilise this site for an output much in excess of that for which it was originally selected,

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or for which it was suitable, presented many difficulties, indicating the wisdom of taking early steps to establish a modern power-house on a much larger scale.

POWER REQUIRED.

The loading due to the tramways and other existing services of the Commissioners in the metropolis from the year 1906-7 onwards, is shown on the loading curve in Fig. 3, which was prepared in 1912, the forecast being continued in dotted lines from that year at the same rate of increase as the previous two years. The actual loading since 1912 is shown by full lines. After maintaining very closely the previous rate of increase for a further two years, the curve falls slightly in 1914-15, and has since continued practically level. This is, of course, an effect of the war.

In dealing with future requirements, however, it has been recognised that the existing loading will, in all probability, be rapidly dwarfed by the requirements of railway traction, which may be expected to reach something of the order of 100,000 kilowatts within a measurable period after commencing operation.

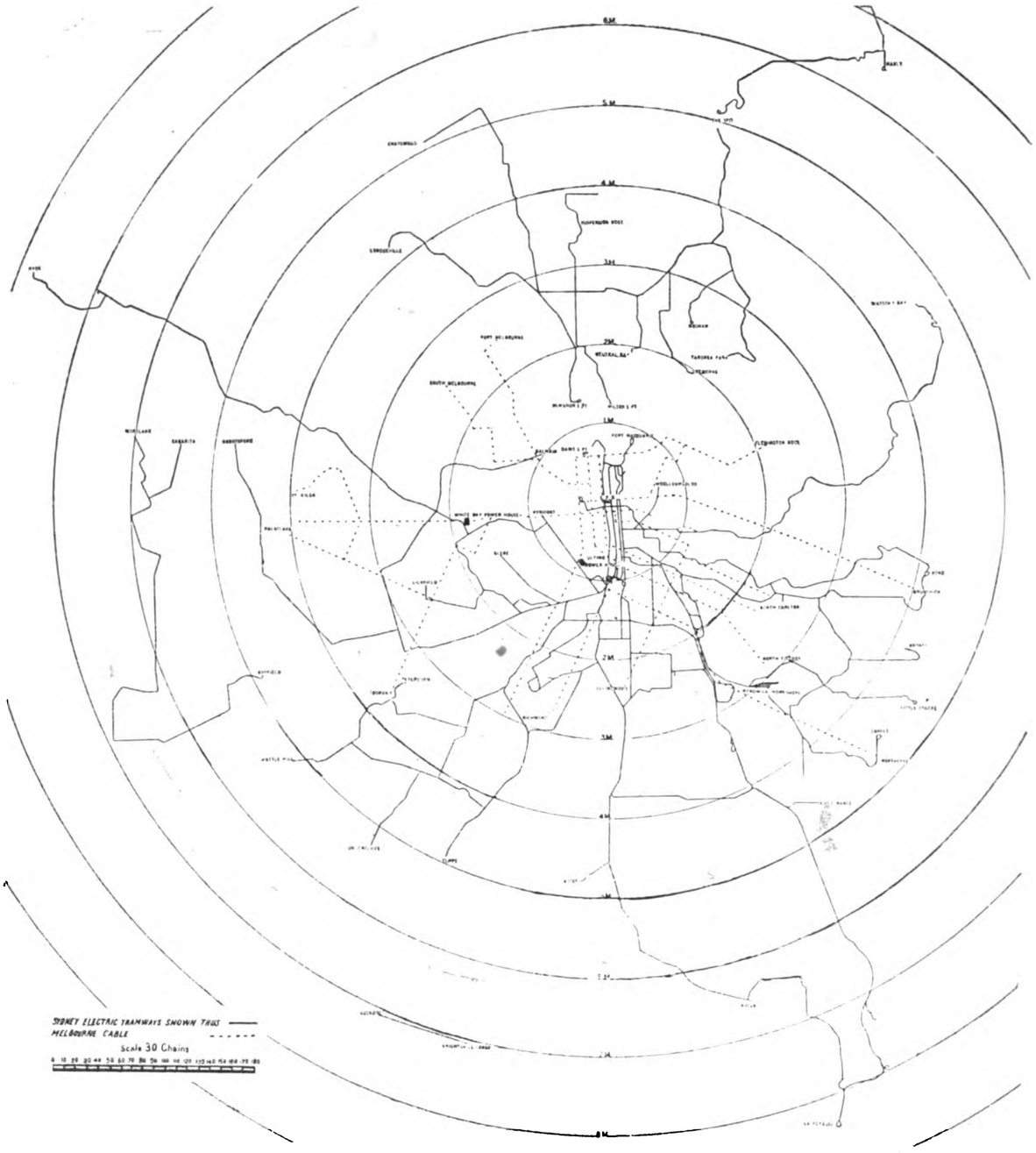

Fig. 2.—Area Covered by Sydney Electric Tramways, showing also, in Dotted Lines, Comparative Extent of Melbourne Cable Tramways System.

(Circles indicate mile distances from General Post Office.)

SYSTEM.

In pursuance of my recommendation that early steps should be taken to establish an additional source of electric supply for the metropolis designed on a larger scale than the Ultimo Power-house, the question of the class of generating plant to be adopted was made a matter for special investigation during my visit to Europe and America in the year 1910. As it had not been shown that there was any water power in the State

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which it would be good public policy to transmit to Sydney for the purpose in view, there remained two preliminary problems—first, whether the location of the generating plant should be at the mine or in the area of supply; and second, whether the prime movers should be gas engines or steam turbines. The former question resolves itself, of course, into a comparison of the cost of transportation of the coal with the total costs of transmission of the current over the distance in question; allowance also being made for the local advantages for generation at each end.

Transmission.

Selecting the western district as presenting the best case for transmission, the distance may be taken as 90 miles. Adopting a pressure of 100,000 volts, with a maximum load of 100,000 kilowatts, and a load factor of about 40 per cent., representing an output of one million kilowatt-hours per day, and allowing a duplicate line with good steel tower construction, the cost of transmitting the energy, inclusive of capital charges, with copper at £70 per ton, would be not less than ·07d. per kilowatt-hour delivered. The transportation of the coal at the cost to the Commissioners, viz., ½d. per mile per ton, allowing a fuel consumption of 2 lb. per kilowatt-hour, represents ·04d., showing a margin of ·03d. per kilowatt-hour in favour of generating in the metropolis. While it has to be admitted that the first cost of the city site is greater than that of an equal area in the western district, this disadvantage is entirely outweighed by the unlimited circulating water supply available in Sydney; in addition to which there are other financial advantages, connected with staff, repairs, and concentration of management, which do not call for elaboration here. An important consideration of a commercial nature was that in the placing of their annual contracts for coal, the Commissioners have frequently utilised the power-house orders to obtain improved terms in connection with the much larger railway requirements; and the Sydney site allowed a special freedom of action in this respect. The net result was therefore very much in favour of the course taken. It will be recognised that the foregoing is not offered as a general comparison of the two methods; and that the conditions specified apply, in their entirety, only to the Commissioners' service, and to the particular case under review.

Producer Gas Engines.

The relative merits of gas engines and steam turbines were being vigorously debated when the decision was required for the new station; and in view of the very strong claims put forward for the former, on the ground of higher efficiency and the possibility of the return of a large part of the cost of the coal by the sale of the by-products recovered from the producers, the decision was one of considerable responsibility. One hesitated to commit the State to the installation of a steam plant representing an expenditure of approximately a million pounds sterling, and necessitating for an indefinite period of years a coal consumption of the order of a thousand tons daily, while confident statements were being put forward, and backed by a great display of apparently supporting evidence, that the same output could be obtained from gas plants, requiring only a fraction of the coal, and furnishing by-products which would pay nearly the whole cost of what fuel was consumed.

Most of our members followed with interest the gradual destruction of the gas engine's pretensions as a competitor of the steam turbine for this class of service. The failure of the attainable efficiency of the former to substantiate the claims advanced, and the steady improvements in turbine results, together materially reduced the discrepancy in fuel economy. Meanwhile the establishing of the limit of about 4,000 horse-power as the practicable size for the gas engine, put it at a disastrous disadvantage for large modern power-houses as compared with its competitor, which is now being built in units of 100,000 H.P., and has improved in efficiency with each increase in size. Then the troubles with engines using producer gas altogether falsified the hopes which had been encouraged by the successful operation of large furnace gas plants, where the refractory hydrogen content was not in evidence. And finally, the by-product recovery for the most part did not materialise as a practicable commercial undertaking.

It was with a lightened sense of responsibility therefore that I finally decided to recommend adhering to the use of steam turbines, a decision which has been consistently sustained by subsequent developments.

White Bay Power-house Site.

The selection of a suitable location for a large modern power-house absorbed much time, and involved the

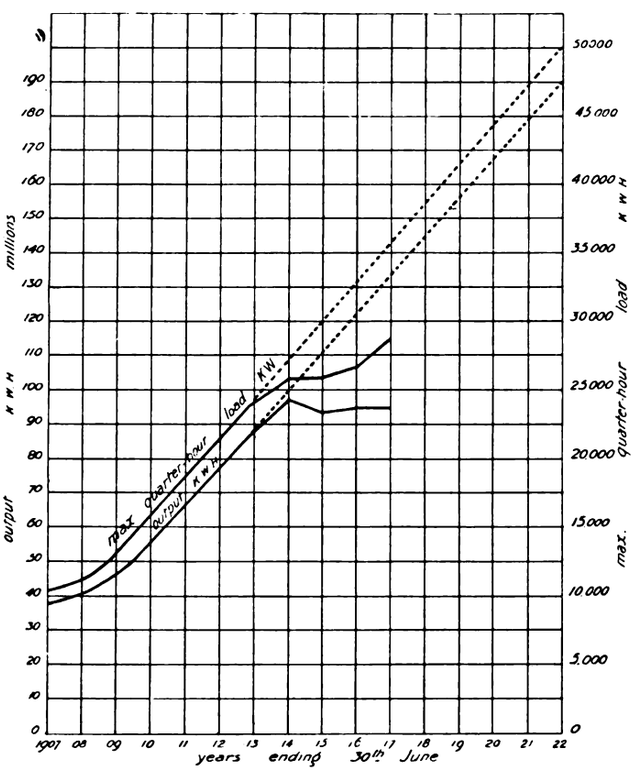

Fig. 3.—Diagram showing Load Forecast 1913–1922.

consideration of many sites, before that at White Bay was chosen as the one that most fully met all the salient requirements.

The available area is sufficient for a plant having an output of well over 100,000 kilowatts, and for the necessary tracks for satisfactorily handling the fuel, ashes, stores, and machinery, etc. The railway and tramway lines run practically through the site, thus providing at a nominal cost the necessary rail connection to these services. The conditions are also most favourable for shipping facilities, either for the delivery of heavy pieces of machinery from overseas, or, if necessary, for fuel. There is unlimited circulating water available from White Bay, and a sufficient depth to ensure practically the minimum temperature obtainable in the harbour. Glebe Island separates the inlet in White Bay from the outlet in Rozelle Bay, thus preventing the possibility of the temperature of the

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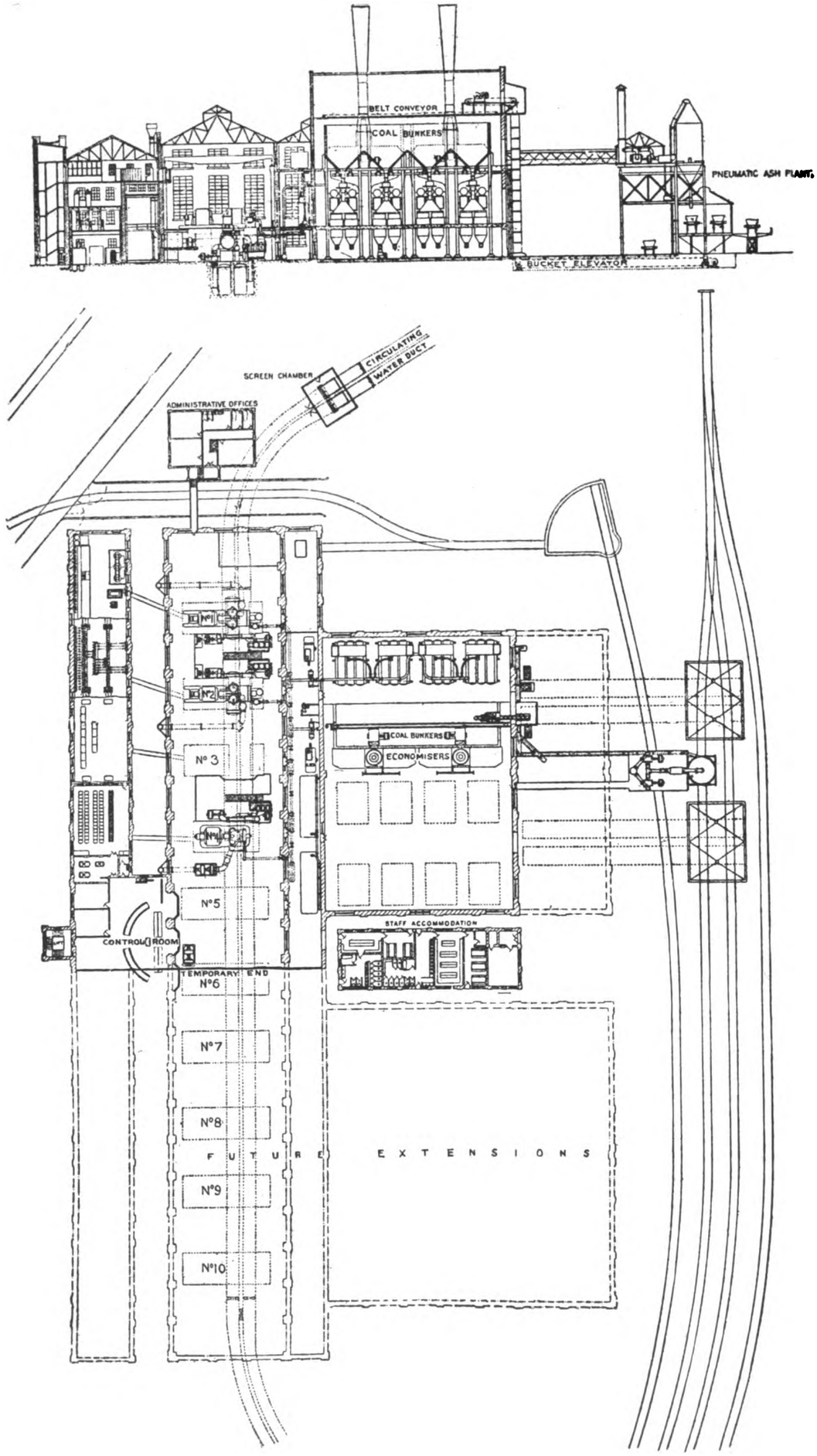

Fig. 4.—Plan and Section of White Bay Power-House, Sydney, N.S.W.

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supply being raised by the discharge—a contingency which it is necessary to provide when dealing with two million cubic feet of water an hour. The ground level over the whole area ultimately to be covered by the power-house was sufficiently low to permit of the minimum lift for the circulating water, without involving expensive excavating. The site is fairly centrally situated in relation to the existing electric system and to the future suburban railway service. This will be seen by a reference to Fig. 2, and in this connection it must be remembered that the Long Nose Point-Greenwich tunnel is being constructed to provide a direct route for the cables of the North Sydney services. And finally, in relation to all these advantages, the cost of the site was very low, partly as the result of extensive changes being made in the district by the department.

Unit Scheme.

The scheme provides for eight steam-raising units and ten electric generating units. Of the latter, one may be regarded as available for overhaul and one as standby, leaving eight complete power plants, each laid out in practically a straight line transversely across the power-house from coal hopper to outgoing feeders, and each equipped with the following:—A coal hopper under the railway track, coal elevator, and conveyor; a battery of boilers, each of which has an economiser and automatic coal weigher, motors for driving chain grate stokers and economiser cleaners, and a chimney stack and blower for each pair of boilers; a make-up water reservoir, a hot well and condenser recorder, and a motor-driven feed pump and feed water meter; a main turbine, alternator, and exciter, with ventilating fan and air filter; condenser, circulating pump, and air pump, and the generator reactances and auxiliary transformer; and generator, feeder, and transfer bus-bars and switches. Each such unit is connected throughout with the necessary water and steam piping and conductors, so that each is entirely separable, and can operate as a power plant independent of other units in all respects, except that under some circumstances it will be unavoidable that the steam headers of two or more units be connected, and there is a common current supply for the remote control of the switches. It is not considered that this claim is discounted by the fact that each coal bunker is common to two boiler batteries, and that the two circulating water channels under the turbine house provide for all units. The capstans for handling the coal trucks, and the overhead crane, of course, serve the whole power-house, and the pneumatic ash plant supplies the requirements of four boiler batteries; but other means of meeting this service are available for each boiler if required.

For each two units there is a spare motor, arranged so that it can be coupled up to take the place of the motor driving the stoker countershaft of either unit; and also a steam turbine-driven feed pump with Venturi meter to replace the motor-driven feed pump of either or both units. Stand-by alternate and direct current supplies, for the auxiliary services, are provided.

Buildings.

The plan and section of the station are shown in Fig. 4, the portion not yet erected being dotted in. The buildings, which comprise boiler-houses, pump-house, turbine-house, and switch-house, are of brick with galvanised iron roofing, the whole of the internal structural work being of steel, and the floors of reinforced concrete. The turbine house will have an internal length of 465 ft. 6 in., with a clear width of 60 ft. The height of the building, from the basement floor to the spring of the roof, is 67 ft. 6 in.; the turbine floor is 19 ft. above that of the basement; and the overhead crane clears the turbine floor by 38 ft. The turbine-house will accommodate ten turbo-alternators and their auxiliaries. The emergency motor-generator exciting sets are also placed in this house. At the northern end of the house the turbine floor is discontinued so as to form a dock, measuring 33 ft. by 19 ft. The machinery, stores, etc., are loaded into, or unloaded from, the railway or tramway trucks, or road vehicles, standing in the dock, by the 50-ton power-house crane. The tracks, which are laid on the basement floor, lead through the pump-house, past the tramway points, to a turntable, which provides a connection with the railways.

The object of the pump-house is to provide a safeguard in case of trouble with the piping systems; and also to house the steam valves, the feed water equipment, and the numerous measuring instruments under the most favourable conditions. It forms an annexe 18 ft. wide on the eastern side of the turbine-house, along the whole length of the building, and contains the main steam headers and valves, the interconnecting steam pipes between the units, the make-up water reservoirs, hot wells, condensate recorders, feed pumps, feed water meters, and recording steam pressure gauges. The workshop and stores are also accommodated in this section.

The arranging of the boilers in batteries at right angles to the pump-house presents three advantages over the parallel layout, viz., the unit system can be applied to all the boiler-house services, better lighting and ventilation are attainable, and the quota of boilers can be located adjacent to each turbine without having waste space in the turbine-house. The two boiler-houses will each accommodate four batteries of boilers.

The internal width of each house is 155 ft. 3 in., the height from the basement floor to the spring of the roof being 80 ft. The length of the future house will be 171 ft. 5 in., that of the present house being 106 ft. 5 in. The latter accommodates two batteries of four boilers each; but as developments during the construction of the power-house showed the feasibility and advisability of increasing the capacity of the plant, arrangements were made for increased boiler capacity in the second house, and the coal and ash equipment of the existing boiler-house were placed so as to admit of a similar extension ultimately.

The switch-house extends the whole length of the power-house, from which it is separated by an intervening space of 17 ft. The switch-house will measure 465 ft. 6 in. long by 30 ft. 3 in. wide, and has a basement accommodating the alternator reactances, the transformers for the auxiliaries, and the terminal equipment of the underground cables, a bus floor, a switch floor, and a shorter top floor, on which are the remote control boards and the secondary batteries and boosters, etc.

Circulating Water.

In connection with the circulating water provision, the experience gained at Ultimo has been very helpful in the effort to make the White Bay arrangements as near ideal as possible. The provision made will suffice for 12 million gallons of circulating water per hour. A concrete channel of ample dimensions, and 363 ft. in length, connects White Bay with the first settling well. The latter is furnished with fixed screens and two sluice gates, controlling admission to the two six-foot square ducts, which provide a total cross sectional area of 72 square feet.

The top of the ducts is 24 in. below the lowest known tide level; the ducts being therefore always charged with water under some head. At a distance of 500 ft. from the settling well is the strainer, which consists of

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two motor-operated rotary wire screens placed across the ducts so as to catch and lift all objects too large to pass through the condenser tubes. The screens, composed of brass wire, No. 12 S.W.G., with five-eighths inch square mesh, travel at 15 ft. per minute. The rubbish is removed by a revolving brush. From the strainer the ducts continue a distance of 90 ft. to the northern end of the turbine house, connecting with the two longitudinal channels, each measuring 17 ft. 7 in. deep by 7 ft. wide, which traverse the whole length of the building, being located immediately under the main condensers.

The western channel is used for the supply and the eastern for the discharge, vertical chambers being provided at each condenser in the outer sides of the channels to allow of the ends of the suction and discharge pipes being well submerged, while leaving the full section of the channel clear for the unimpeded flow of the water.

A motor-operated sluice gate is provided at the entrance to each channel, and a third between the two ducts. Similar provision is made at the southern end of the building where the channels connect with the ducts leading to Rozelle Bay, which have the same section as the northern ducts. At a distance of 300 ft. from the power-house there is a settling well of 20 ft. diameter, after which the ducts are continued a further distance of 363 ft. to the discharge well built in Rozelle Bay. This is a rectangular concrete structure 26 ft. square. It is divided into two chambers, each having a sluice gate at the end of the duct, and an open outlet into the bay.

The ordinary practice is to close the sluice gates in the power-house at the southern end of the western channel and at the northern end of the eastern channel, keeping all others open; thus drawing water from White Bay through both northern ducts, and discharging into Rozelle Bay through both southern ducts. The flow in the ducts may be reversed, however, by reversing the positions of the four channel sluice gates. It is thought that by occasionally adopting this course, and operating for a few hours with a low vacuum so as to raise the temperature of the discharged water, the vegetable and animal growths in the ducts ordinarily used for intake may be checked.

Coal Supply.

In the design of the coal supply arrangements consideration has been given not only to the three cardinal features already emphasised, but also to celerity of handling and facility of mixing; and if the provision made appears somewhat generous at first sight, it may be well to remember that each of the eight equipments has to be equal to providing fuel for an output of over 20,000 horse-power. Celerity of handling, it may be remarked, is necessary not only to fill depleted bunkers rapidly, but also to release the railway trucks, which have an apparently incurable habit of coming forward in overwhelming numbers after a lull.

A connection from the Glebe Island railway leads to the coal tracks, the duplication of which, while presenting the advantage of additional full truck storage accommodation, provides also for coal mixing. This is of no small importance, as the class of coal is quite frequently not a matter of choice; and there are some coals which do not burn at all satisfactorily alone, but with which fairly efficient combustion can be attained in a suitable mixture.

The coal tracks are erected on a steel viaduct at a height of 14 ft. above the ground (Fig. 1), to allow for the hopper over the conveyor filler, the floor of the chamber for which is eight feet below ground level. The hopper for each conveyor extends laterally under the two tracks sufficiently to allow of discharging the coal from both sides of a D truck on either track. By confining each type of coal to one track, the proportions for mixing correctly are under control. The trucks are brought up by motor-operated capstans as far as the northerly hopper, after which the empties gravitate down the grade over the automatic points to the kickback, and return on to the empties track, the grade of which allows of their being made up into trains. Each coal hopper is opposite its corresponding boiler battery. The top measures 21 ft. by 30 ft., and is furnished with a grid of three-inch mesh to stop large blocks of coal or foreign materials. The sides of the hopper are inclined at 40 deg. and 51½ deg. respectively from the horizontal. The coal is delivered direct from the bottom of the hopper into the rotary filler of the conveyor, which is of the gravity bucket type, travelling at 50 ft. per minute, and having a capacity of 50 tons per hour.

Boiler House.

The concrete conveyor tunnel extends from the bottom of the hopper to the foot of a steel uptake on the face of the boiler-house, at the top of which the coal is delivered on to the 18 in. troughed rubber belt, which travels at a speed of 300 ft. per minute to the end of the coal bunker over the boilers. The tripping device on the belt discharges the coal on either side as required, thus trimming the bunker; and it can be set to travel automatically to and fro from end to end of the bunker, thus ensuring as nearly as possible perfect mixture of the coal when desired. As each bunker serves two batteries of boilers, it is furnished with two conveyors, located with centres 25 ft. apart to ensure the best trimming.

The capacity of the existing bunker is 1,780 tons. It is 92 ft. long, 48 ft. wide, and 25 ft. deep, the sides having an incline of 45 deg. from the horizontal. The bunker is of steel framing, filled in with ferro-concrete. There are four openings for each of the two batteries of boilers, the bottom of the bunker being ridged between the openings to prevent trouble due to stagnant coal. Each opening feeds a Dennison automatic weigher, from which the coal passes into the distributing chute leading to the hoppers of the two chain grates of one boiler.

The boilers, which carry a pressure of 180 lb. per square inch, present the usual features of the Babcock and Wilcox make, having three steam drums 24 ft. 9 in. long by 4 ft. diameter, and 27 sections of 14 tubes each, 18 ft. in length and 4 in. in diameter. There are 148 superheater tubes of 1½ in. diameter, with a heating surface of 2,035 square feet; the total heating surface of the boiler being 8,283 square feet. The boilers are frequently worked to over 40,000 lb. of steam per hour each, with a superheat of 200 deg. Fahrenheit. The outer surface of the brickwork is treated with a coat of special paint, and steel casing is provided to reduce air leakage, the intervening space being packed with two inches of magnesia heat-insulating compound.

The grates, which have a combined area of 196 square feet per boiler, are a departure from the standard design, having an inclination of 1 in 6 from the horizontal to provide a suitable furnace for burning coal with a low volatile hydro-carbon content. Time does not admit of our following the troublous history of the development at White Bay of the most suitable furnace design for the southern coal. The problem was to maintain a sufficiently high temperature throughout the journey of the carbon to the end of the chain grate to ensure combustion, and also to provide favourable condi-

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tions for a thorough mixture of the gases in the furnace, while avoiding excessively high local temperatures and erosive action of the liberated gases, with consequent destruction of the firebricks. The department's last modification, during a service of over three years, has proved to be the only design combining highly efficient combustion with reasonable life for the brickwork.

The gases pass through the insulated uptake at the back of the boilers to the economiser on the economiser floor, as shown in Fig. 4. The economisers are of the standard Green type, each having 288 tubes, with a heating surface of 2,880 square feet, and the usual motor-driven cleaning device. The gases pass direct from the economiser into the chimney stack, which is of the inverted cone design, and is furnished with the Pratt cold air ejector system of draught. The advantages claimed for this arrangement are high efficiency, cool working blower, and ventilation for the boiler-house. The fan, which is coupled to an induction motor, operating at 485 revolutions per minute, furnishes a draught of two inches at the chimney base.

Ash Removal.

Owing to the turbine floor level being preserved in the boiler-room, the boiler-house basement is lofty and well ventilated. Nevertheless, it was considered advantageous to adhere to the system of ash removal which the department adopted to overcome difficulties arising from quite opposite conditions at the Ultimo Power-house.

The general features of the scheme are as follows :—Immediately under the back of each grate is a capacious hopper, extending into the boiler-house basement, and equipped with an ash valve at a sufficient height to allow room for a clinker breaker, which is propelled by hand on light rails laid in the basement floor under the ash valves. This track may also be used for skips to remove the ash in case of stoppage of the pneumatic service. The breaker is motor-driven, a wall plug and flexible lead furnishing the connection. An opening in the floor, ordinarily sealed by a flush cast-iron cover, is located under each hopper, so as to receive the discharge from the breaker. The covers of the openings constitute short sections of the upper half of the ten-inch suction pipe, of which there is a branch for each boiler battery. The extreme end of the branch in service is left open, as it is an essential feature of this system that a good stream of air must be passing continuously during operation. The unimpeded flow of the air is about 5,000 cubic feet per minute, the speed of travel being about 10,000 feet per minute. The thickness of the wall of the pipe is varied to allow for wear, being as much as two inches in the vicinity of the bends.

The department has established the fact that, with normal prices of £15 per ton for cast-iron, and £27 for hematite iron, the maintenance cost of pipes of the latter is considerably less than half that of cast-iron pipes ; a fact which does not yet appear to be appreciated by makers of these plants. The bends supplied by the contractors have massive renewable wearing plugs, which can be brought forward as wear occurs. They can also be removed to facilitate clearing of the pipes in the event of their choking. Filling is permissible at only one opening at a time, and therefore all the piping is of the same size. There are five bends in the path from the ash hopper to the 40-ton ash tank, which is mounted above the coal track, so as to discharge into one of the recently emptied coal trucks. The upper portion of the tank has an equipment of water nozzles, which maintain a fine spray, through which all the air has to pass. Having been relieved of all but the lightest dust, the air is conveyed through a Sturtevant air washer before entering one of the duplicate blowers, from which it is discharged through a 47 ft. steel shaft, of 48 in. diameter, into the atmosphere. The washer is of the makers' standard type, with fine nozzle sprays and eliminators. The blowers are of the Sturtevant make, with a three-arm impeller and idler. Each blower is direct coupled to a 70 H.P. induction motor, operating at 287 revolutions per minute, giving a pressure of 54 inches of water, with the full output of 5,000 cubic feet of air per minute. A useful feature of the equipment is the application of the system to the removal of the soot from the economisers.

Steam Piping.

The general steam piping scheme is shown in Fig. 4, and may be briefly described as consisting of the provision of ten short 33 in. diameter steam headers, on the basement floor of the pump-house, each having a connection to the corresponding turbine ; the four batteries of boilers in each half of the power-house are connected to the two outer pairs of the five headers, each boiler to the nearest header, headers Nos. 3 and 8 having no direct boiler connection ; and, finally, adjacent headers are connected. Each of the connections mentioned has a Hopkinson stop valve, the valves in the boiler main being operable from either floor of the pump-house. The headers are equipped with steam traps, and constitute efficient separators, and all valves are so placed as to avoid water pockets. The station design allows practically unlimited provision for expansion of the steam piping, due to temperature variations, and this feature has been freely utilised.

Pump House.

Each unit has a cast-iron make-up water reservoir of 17,500 gallons capacity, erected on steel joists, between the walls of the pump-house, at a height of 32 ft. 9 in. above the generator floor, and a 6,000 gallon hot well standing on that floor. The feed pump is of the centrifugal 6-stage type, direct coupled to a 440-volt induction motor, operating at 1,450 revolutions per minute, and has an output of 360 gallons per minute, at 204 lbs. pressure. The standby feed pump, which serves for two batteries, is of the centrifugal 2-stage type, direct driven by a single-stage Allen turbine, and furnishing, at 3,120 revolutions per minute, a supply of 480 gallons. This set, being intended for standby service only, was arranged to operate non-condensing. Recently, however, the exhaust has been discharged into an ejector condenser, using the feed water for the jet. This arrangement promises so well in regard to vacuum maintained, and resulting thermal efficiency, that it may be adopted for regular working; in which case a second turbo-pump would be installed, and the electric pumps retained as standby.

Turbine House.

The three turbo-alternators installed (Fig. 6) furnish 25-cycle, 3-phase current, at 6,600 volts. Two are of the Willans-Dick-Kerr make, with turbines of the disc and drum type, having a continuous rating of 7,000 KW., and an overload capacity of 10,500 KW. for two hours, the speed being 750 revolutions per minute. Each condenser is furnished with 3,830 tubes, providing a cooling surface of 14,050 square feet, in addition to which there is an augmentor condenser of 386 square feet. The Edwards three-throw air pump, with lift pump attached, operates at 105 revolutions per minute. The centrifugal circulating water pump is of Allen's Conqueror type, the casing and impeller being of gun-metal. It stands on the basement floor, 3 ft. 3 in. above highest known tide, and is located alongside

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the condenser, immediately over the chamber in the supply channel; the total length of circulating water piping from channel to pump, pump to condenser, and condenser to discharge channel being 56 feet. The submerging of the end of the discharge pipe ensures the syphon effect. The Dick Kerr alternators are furnished with motor-driven fans, and ample space is available in the basement for an air filter, which, in view of its success at Ultimo, will probably be of the cylindrical air-washing type. Three of the Willans-Dick-Kerr machines were ordered, but owing to British industrial troubles delaying delivery, a Curtis General Electric turbo-alternator was ordered and installed on No. 4 foundation, and No. 3 machine, on arrival, was installed at Ultimo. The American set operates at 1,500 revolutions per minute, and has a conservative continuous rating of 7,500 kilowatts, with no guaranteed overload. The exciters are direct coupled to the alternators in each case. The circulating water and air pumps and motors of No. 4 are similar in type to those for the Willans set, the pumps being coupled to 125 horse-power induction motors, supplied from the 440 volt transformer of the unit.

A duplicate set of 120 kilowatt, 440 volt, A.C., 120 volt D.C. reversible motor generators provides for the charging of the emergency battery, an emergency excitation service being available either from the battery or from the motor-generator. By reversing the motor generator, operating it with the battery current, the necessary 440 volt alternate current is furnished for the auxiliaries when starting up after a shut down.

It is of interest to note that the Dick Kerr alternator stators had to be built in separate halves to bring the weights within the capacity of the shipping appliances. The General Electric Company preferred to assemble the laminations of their stator *in situ*.

Switch-house: Considerations.

In the matter of the location of the switch apparatus, primary consideration was given to the importance of securing for the generating and switching equipments of a plant of this ultimate magnitude, that very necessary protection against the possibility of mutual interference which is obtainable only by housing them in separate buildings. While a parallel relation to the turbine house was approved as offering obvious advantages in preserving the unit design, sufficient intervening space was allowed to provide lighting and ventilation for both buildings. After due weight had been allowed for the considerations in favour of a remote control room some distance from the main building, it was decided that the greater advantage lay in preserving the operator's close association with, and constant knowledge of, the conditions in the turbine house, while locating him in a position safe from the effects of accidents to the running plant. The control room itself was therefore arranged to extend across a bridge spanning the distance between the switch and turbine houses, and is provided with windows opening into the latter just below the running rail of the crane. The operator is thus given a commanding view of the whole of the turbine house, from what will be a central position in the completed building.

An endeavour has been made in the design of the switch-house layout, to instal reliable apparatus with an entire absence of combustible material; to allow ample space everywhere, and as far as possible to arrange so that all portions of the equipment shall at all times be open to inspection. While it is hoped that these features will tend to prevent breakdown, it has been recognised that the unforeseen can and will occur occasionally, in spite of such precautions; and also that when high tension current, backed by thousands of kilowatts of running plant, gets out of hand, there is a degree of uncertainty about its behaviour. For instance, only a few weeks ago, when a piece of apparatus broke down at White Bay, the arc bridged the intervening space and fused portions of the equipment nine feet distant. It has been accepted therefore that considerable expenditure is justified to minimise the amount of equipment necessarily out of service while a fault exists at any one spot, a result which can only be achieved by a high degree of sub-division of the electrical equipment, with alternative connections of each separable part to the main system.

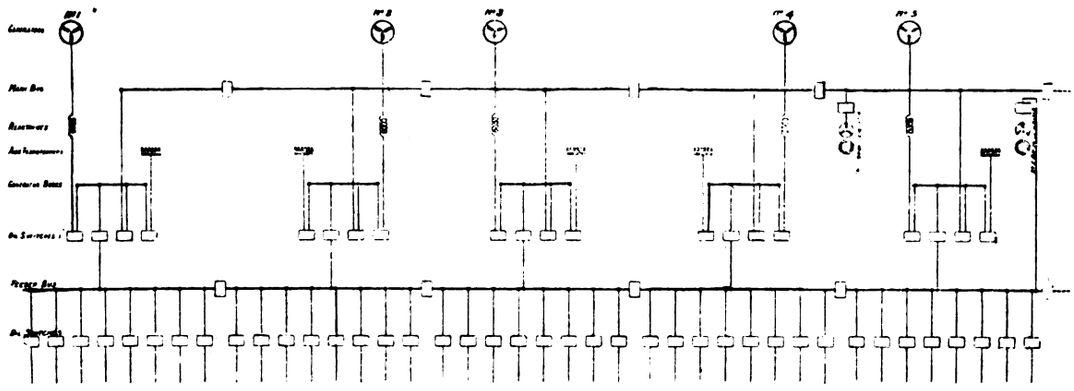

Fig. 5.—Diagram of Switchboard Connections—White Bay Power Station.

Switching Scheme.

The scheme finally adopted, as shown in Fig. 5, provides for feeder and transfer buses in sections, one for each unit, and separate generator buses. Each of the latter is furnished with its generator switch, the corresponding auxiliaries transformer switch, and group and selector switches. Oil switches separate the sections of feeder bus, but the transfer bus sections are united at present by knife switches. (Provision has, however, been made for oil switches later, if found desirable.) Each section of feeder bus supplies eight feeder switches. It will be seen that a generator can be laid up only by trouble in itself, or within the switches connected to its own bus. The arrangement also admits of each of any number of generators furnishing supply to its own group alone, while the remainder of the station operates in parallel. As each sub-station is connected to two or more feeder buses, no one fault in the switch-house can put a sub-station out of commission.

Reactances.

The question of the limitation of the possible magnitude of short-circuits is now recognised as one of

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primary importance in the design of large steam stations. Steinmetz has approximated the temporary output of energy from a station of the size of White Bay, in case of unprotected short-circuit, at from five million to eight million horse-power. The provision of some additional reactance is therefore imperative. After consideration of the various methods, it was decided to insert in each phase of each generator an external reactance coil designed to reduce the initial short-circuit to about twelve times full load. Each set of reactance coils is located in the basement on the turbine house side of the switch-house, alongside the corresponding 350 KW. auxiliaries transformer, from which it is separated by a brick wall.

It was considered undesirable to use a three-core cable between the alternator and the reactances, in view of the absence of any protection in case of short-circuit between the cores. On the other hand, there were objections to single-core lead-covered cables, on account of the inductive effects. Single core, varnished, cambric insulated, asbestos-covered cables were therefore installed in separate bitumenised fibre ducts, set in concrete. Some difficulty was encountered with these ducts, partly owing to the water-logging of the ground after rain; and therefore in view of the importance of this service, appearance was sacrificed to security, and the ducts were relaid above ground level.

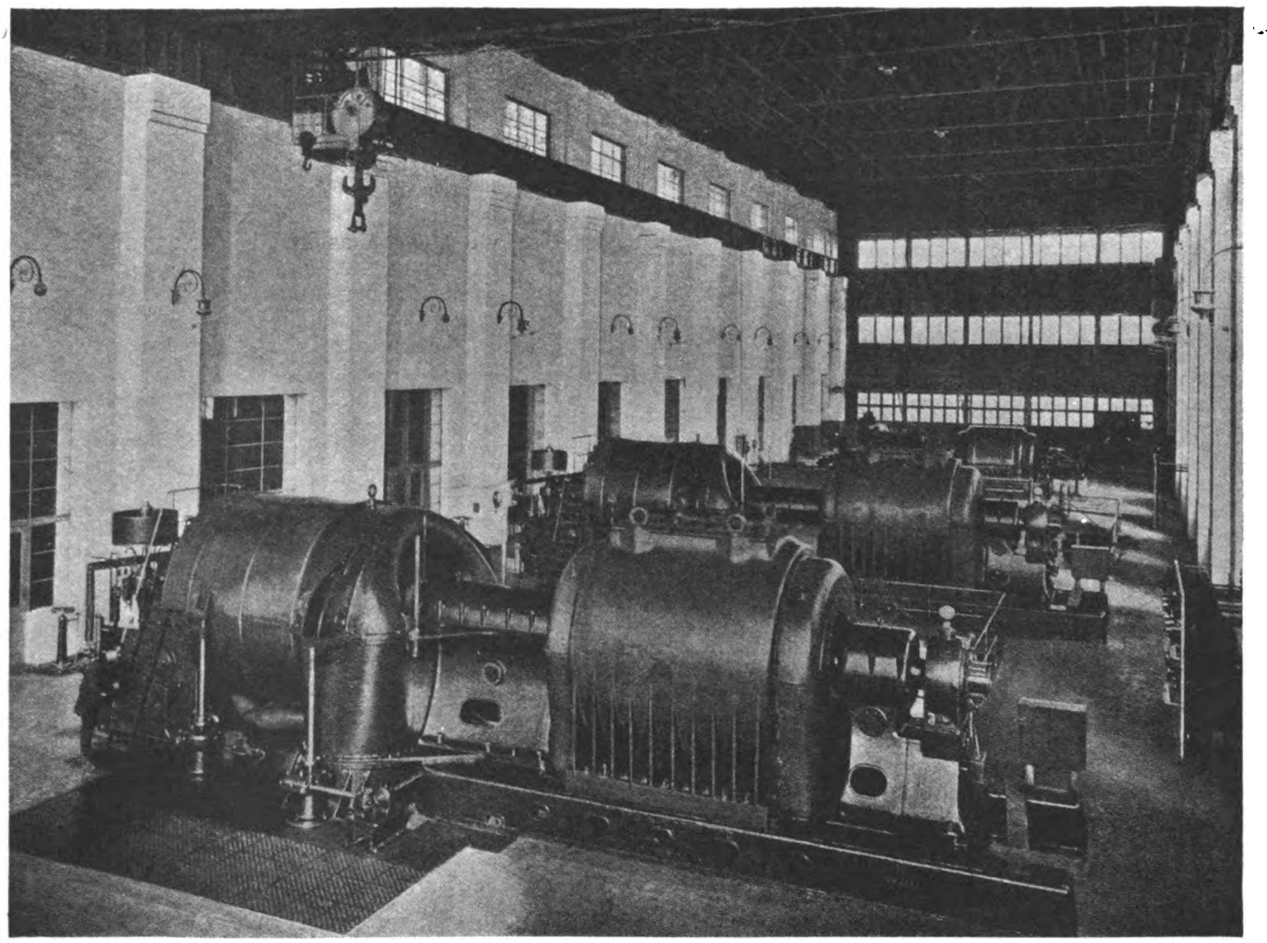

Fig. 6.—Interior of Turbine Room—White Bay Power Station.

Switch-house Details.

The conductors for the generator circuits and the busbars are of four-inch by one-quarter inch bare copper bar, while fifteenth-sixteenth diameter copper tube is used for the auxiliaries transformer circuit, and the connections from the feeder switches to the knife switches at the trifurcating bells of the underground paper-insulated lead-covered cables. These knife switches are so arranged that each feeder can be switched off its oil switch and directly on to the feeder test, or earthing, busbars. Each conductor is protected throughout by a brick channel on the wall or ceiling, and where conductors cross, as, for instance, in the case of the switch connections to the busbars, a brick wall is interposed. Each feeder group is equipped with a G.E. electro-static earth detector, and an aluminium surge arrestor, located over the feeder cable transfer pits. There are two of the latter extending the full length of the switch-house, with connecting openings every 4 ft. 6 in., thus furnishing protection for transfer cables, for which shelves are provided. American General Electric porcelain insulators are used throughout, those carrying the busbars being of special design to permit of expansion and contraction. The busbars of the three phases are arranged vertically in each case, with 3 in. concrete dividing slabs. The risers for the feeder bus and transfer bus dividing switches furnish a passage-way in the bus room between the sections of feeder bus and transfer bus.

The high-tension switches are of the American General Electric motor-operated H-3 type, contained in cubicles, having glazed ends and Keene's cement faced bricked sides, treated with Toch's white enamel. The doors are suspended so as to be self-closing by gravity, and to open and release the air pressure in case of explosion. To provide a still more rapid

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escape the upper portion of the door is furnished with light double doors on vertical gravity hinges.

The capacity of the generator, group, and selector switches is 1,200 amperes in each case; that of the auxiliaries transformer and feeder switches being 300 amperes.

The control room is situated on the upper floor of the switch-house. The operator's desk is centrally situated between the generator bench boards and a semi-circle of feeder panels, so that all the indicating instruments are presented to the operator's view. The remote control pull switches on the generator board are arranged on a mimic bus system, with the usual illuminated repeater signal lamps furnishing an immediate indication to the operator of the proper movement of the high-tension switch, and also presenting a continuous indication of the position of all switches. Each generator panel carries its own generator, auxiliaries transformer, selector, group, and feeder section switches; the synchronising receptacle, turbine governor control switch, the exciter field control, and the engine-room telegraph; also the main, excitation, and auxiliaries ammeters; the voltmeter, power factor meter, and indicating, integrating, and graphic recording watt meters. The board is also furnished with duplicate synchroscopes and a periodicity indicator. Each feeder panel carries the switches and ammeters for four feeders; two feeder panels thus corresponding to each generator bus. The feeder integrating watt meters and time limit relays are mounted on a secondary panel at the back of the feeder panel, the space between the two panels being kept clear to provide access. The wiring from the control board to the high-tension switches is run in steel conduits concealed in the concrete floor above the switch-room. There is an auxiliary service direct current board, carrying the switches and instruments for the lighting, the two 120 kilowatt motor generators, the two 12·5 kilowatt motor generators for the remote control service, and the batteries and boosters.

On the control floor are also the battery-room, containing the emergency battery and the switch-operating battery; the battery booster room, the test room, and the electrical superintendent's office and the staff accommodation. Immediately beneath the main switchboards is a mezzanine floor, giving free access to the control system connections, and accommodating the resistances.

In the lighting of the building, arrangements had been made for the free use of the mercury vapour lamp, with the addition of the warmer rays of the flame arc, to give the desired normal colour effect. Owing to the war, however, it has been necessary to substitute incandescent lamps for the flame arcs.

Operating.

As regards fuel economy, the practice developed at Ultimo is followed at White Bay. Each coal is frequently analysed for fixed carbon, volatile hydrocarbon, hygroscopic moisture and ash, and the calorific value is also ascertained by a bomb calorimeter. Automatic recording gas analysers for measuring the percentage of CO_2 in the flue gases have been used at Ultimo since the year 1905. A permanent record of the temperature of the gases is furnished by the Roberts-Austin recording pyrometer, which gives continuous concurrent readings from any three of ten connected stations.

The ash is regularly sampled, and the percentage of the unconsumed carbon ascertained. The feed water is measured by means of Venturi tubes, each of which is connected to an indicating, integrating, and recording instrument. The condensate is measured by weir and V-notch recorders. The feed water of each boiler is also regularly sampled and tested.

There are gauges for furnishing graphic records of the steam pressure, and also of the vacuum maintained at each turbine. A baragraph records the barometric pressure for ascertaining the true value of the vacuum.

As already indicated, the completion of the White Bay power-house has been allowed to progress quite slowly for some time past, and it was not until last May that a full working equipment for ordinary operation was available. While there are sundry adjustments that have to be made before the best working conditions will be reached, the following figures of the actual service for that month will probably be of more interest than a statement of the claims of the manufacturers, or the results of test under ideal conditions.

Efficiency Figures and Operating Costs of White Bay Power-house for the Month of May, 1918.

Output in kilowatt-hours	4,982,828
Maximum hourly load in kw.-hours	15,800
Maximum quarter-hourly load in kw.-hours ..	16,320
Used in power-house ..	2·1 per cent.
Load factor on one-hour basis	42·3 per cent.
Heat value of coal as fired	12,937 B.T.U.'S.
Lb. of coal per kw.-hour	1·934
Lb. of steam per kw.-hour (used by turbines)	13·93
Lb. of water per lb. of coal (actual)	7·44
Lb. of water per lb. of coal (from and at 212 deg.)	9·67
Efficiency of boilers, etc.	72·27 per cent.

Operating Costs.

Salaries and wages—
£1,327 3s. 8d. .. 0·0639d. per kw.-hour.

Fuel, supplies, and stores—
£3,149 10s. 3d. .. 0·1517d. per kw.-h.
£4,476 13s. 11d. .. 0·2156d. per kw.-h.

The work of the department is done by the officers, with regard to whose services, while there are both cause and inclination to speak in the highest terms, the expression of my views might not appear in place.

ELECTRICAL TRADE OF BRAZIL.

Forty-two pages of valuable information are contained in a booklet on "The Electrical Trade of Brazil," published by the British Electrical and Allied Manufacturers' Association, of 36, Kingsway. The publication comprises a report prepared by Mr. John M. Glen, the Association's correspondent in Rio de Janeiro. Mr. Glen is the branch manager of Messrs. Mather and Platt, Limited, of Manchester and London. The Association acknowledges its indebtedness to him for his services, and to Messrs. Mather and Platt for allowing the report to be published. In urging upon principals the necessity of visiting the country, Mr. Glen says that they will then realise that the electrical business abroad is a thing entirely different from that within the British Isles. Manufacturers must train and send out men willing to follow a newer policy, and to collect for the application at home knowledge of the needs and preferences of the markets. A far more liberal financial system must also be instituted than has been current up to date. Lectures and books on how to trade with other countries will not give the manufacturer one-tenth of what can be gathered in a week's stay abroad. Branch businesses must be established in the country with the firm's own engineers.

Regarding railway electrification, it is stated that before the war projects were in hand for the electrification of several railways, and within a few years after the conclusion of peace it is possible that the conversion of various sections of five railways may be well under way. Under the heading of tramways, it is stated that the first electrical installation was introduced 25 years ago, and probably no finer system can be seen in the world than that of Rio de Janeiro. In this branch of electrical engineering there is ample scope for Britain, due principally to the fact that all systems utilise direct current, although alternating current is employed for transmission purposes from the hydro-electric generators

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TRACK SECTIONING IN ELECTRIC RAILWAYS.

By E. Capone.

In the construction of electric railways the sectioning and control of supply to the conductor rail has to be arranged to comply with traffic demands, and adapted to the conditions of the permanent way layout. The object of splitting up the conductor rail is to facilitate localisation of faults, and to arrange matters so that the disconnection of any portion should still make it possible for traffic conditions to be maintained without disorganisation. The whole scheme should embody the advantages of being carried out to a standard at all feeding, sectioning, and single line working points. The track layouts and position of operating cabins naturally will not be identical at the different points; but it is generally possible by a little adjustment of cable connections and placing of the conductor rail, to retain the same standard of connections with their respective location of gaps. This also applies to station layouts, junctions, and crossovers where the standard already decided on can be conformed to. This is very important, and much appreciated by the staff operators on the line, also the station officials, all of whom have but to learn once the layout at any point for single line working to be in a position to handle conditions at any railway station; and signalmen at isolating or feeder points are in a position to take control at any similar point along the line without having to study new conditions. On the most recent work of railway electrification the whole question was most carefully considered, and all track and traffic conditions assembled before a definite system of standardisation was prepared.

Feeding points, section switches, station layouts, and single line working were practically embraced, and each respectively adapted and brought to a standard. Signal cabins are generally located at busy points, and can often be conveniently used to take the switchgear, the signal operators being trained for the work. This is a most desirable arrangement, since these men have control of the traffic, and are familiar with the conditions. In facing a problem of this sort it is necessary in the first place to lay out each point of the line, showing cable connections and switchgear, and then to assemble a key plan from which the whole scheme can be followed from the feeding points to the effect of operating section switches and parallel running. It must be remembered that the most economical condition of running is to have the adjacent conductor rails linked together, and the circuit breakers should be arranged to meet that condition.

It is often necessary to feed sections separately, or section to section, as well as to arrange for the isolation of feeders and cross feeding, and it is advisable to have the system shown so that these operations can be carried out diagrammatically. Occasions arise at termini where conditions are somewhat different to straight line working, but the same system can be used in splitting up the lines. A simple terminus station is illustrated, and is given in the sectioning diagram (Fig. 1). Accompanying is an operating key diagram (Fig. 2), demonstrating its use. It should be observed how intersecting lines are arranged so that the breakdown on one section allows an alternative route for the traffic. This is elaborated in some cases so as to give electrical facilities for alternative routes, where provision has to be made for isolating any section of converging lines. Obviously it is not possible to meet all and every condition of traffic emergency, but careful consideration will generally make a good, practical system of working obtainable. One should bear in mind that conformity in design is desired, and in order to attain this each complication of track should not be viewed as an opening for creating an exception on account of extra work or expense; but all means should be tried, such as deviation of cable runs, or altering positions of gaps, to meet each case, and retain standardisation. The breaks or gaps are preferably only made in the conductor rail where the natural intersection of the track necessitates an opening in the conductor rail. To break a continuous length of conductor rail not only requires cable, feeder pillars, bonds and ramps, etc., but makes an extra gap for the collector shoe to jump. For this reason a natural break, if within reasonable distance from the place, is more advisable, and it is often advantageous to run a length of cable and avoid making an additional gap at the spot desired.

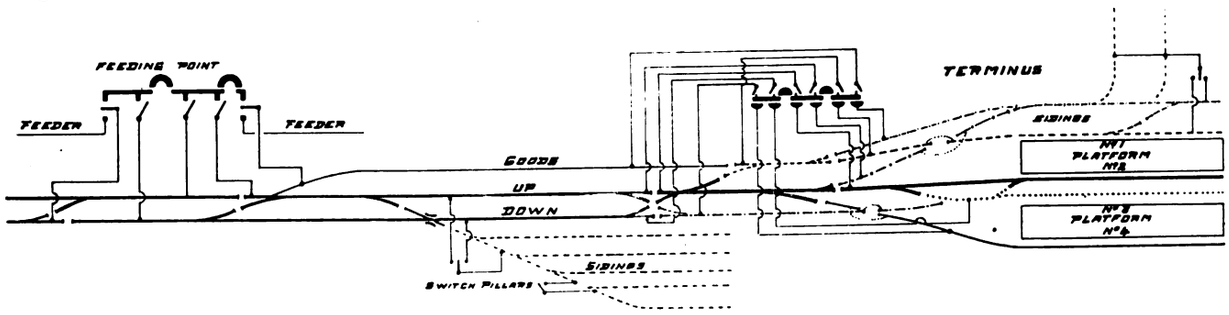

Fig. 1.—Sectioning Diagram.

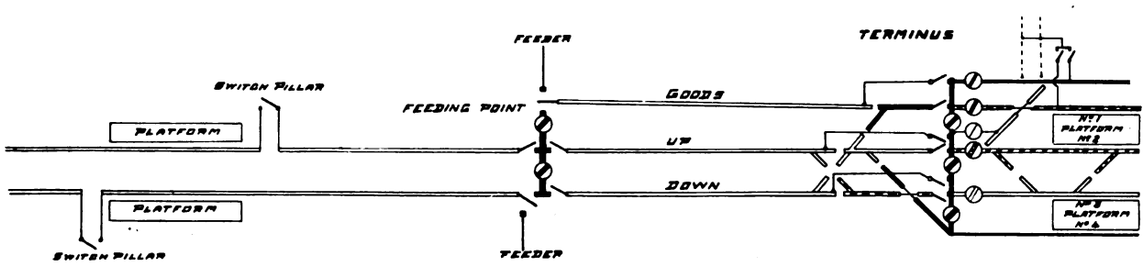

Fig. 2.—Operating Key Diagram.

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At railway stations crossovers are generally provided at each end of the platform to facilitate the shunting of trains locally from up to down lines, and in the layout for the electrification of a line provision should be made to deal with the electric trains in a similar way. At the same time advantage of the latter can be taken to make each such station capable of dealing with an electric train on single line working. How this is done is shown on the illustration (Fig. 3). The train can come up to the up platform and then cross over to the down line, and on to the up line again, as indicated by the arrows. It will be noted the faulty section has not been touched; this is an advantage in case of a breakdown on any section. This method of dealing with electric rolling stock is now in use, and rightly considered essential in working under modern traffic conditions. The isolation of the faulty section shown on the illustration is by opening switch B at the section point, and opening switch C at an intermediate station. The four-coach train can come up to the station, but must not proceed over isolating gap A; the train is therefore backed across to the down line, which it uses to continue its journey until reaching the first available crossover to get on to its correct track, and all oncoming up trains will continue working on this single line until the faulty section can be again put into commission. When this system is in vogue throughout, it gives invaluable flexibility in handling traffic, and it is one of the reasons that makes it advantageous to erect switchgear at the signal cabins, because the signal operator can communicate with adjacent points, and arrange matters immediately.

A good arrangement of a section point is shown, and a simple feeding point is also given where it may be noted that the combination of switches is the same for the sectioning of the track, and gives all the arrangements for feeding and isolation generally required in practice. Throughout the up and down lines are run in parallel, but the precaution is taken of having a circuit breaker between them to give the security of rapid local isolation and automatically to cut out the faulty side. The latter is of importance, as otherwise a fault arising on one line would involve the other, and the time absorbed in locating it might cause serious dislocation of traffic. Use of the circuit breaker should be adhered to at all points throughout the system of switchgear.

It will be noted from the diagram of a feeder point (Fig. 1) that one feeder can be used for any section, or the feeders cut out, when the switches are used (as a section point) at the sub-station end. The feeders have circuit breakers in accordance with standard practice.

There is yet to be considered a terminus. It will be seen from the illustration that the conductor rail acts as a feeder to the station tracks, and each platform or siding is fed through circuit breakers; but the methods of arranging sections of conductor rail are only shown as illustrative of the ways and means of giving an available electrified track in the event of any trouble arising on a portion of the line. Sidings can with advantage be tapped off the conductor rail through a switch pillar, and only made alive when in use. In some cases, where sidings are of special importance, two means of supply may be deemed necessary, in which case a tapping can be taken off up and down lines.

The sectioning diagram of a line (Fig. 1) gives a general idea of what may be considered good practice. Of course elaborations can be introduced, but considering the work that has to be done to answer certain requirements, it would appear that any radical alterations could hardly tend towards simplification or give any practical advantage, especially when the men called upon to operate or maintain have generally to work under conditions where complications are least desirable.

To assist in the efficient operation and training of men to become familiar with their work a great advantage is found in having a large size diagram of each point, and having it erected where it can be seen when operating the switchboard. The work expended is well repaid, especially at rush moments, when men not familiar with switchboard operation are suddenly called upon to telephone instructions. It has been found useful to have the diagram operated in conjunction with the switchboard. The run of connections and bus-bars are shown in a bold and simple form, and the switches and circuit breakers are represented by discs, so that the connections can be seen at a glance. One method is to paint the connections on the front of the switchboard, but this is not so easy or convenient for reading as a separate diagram.

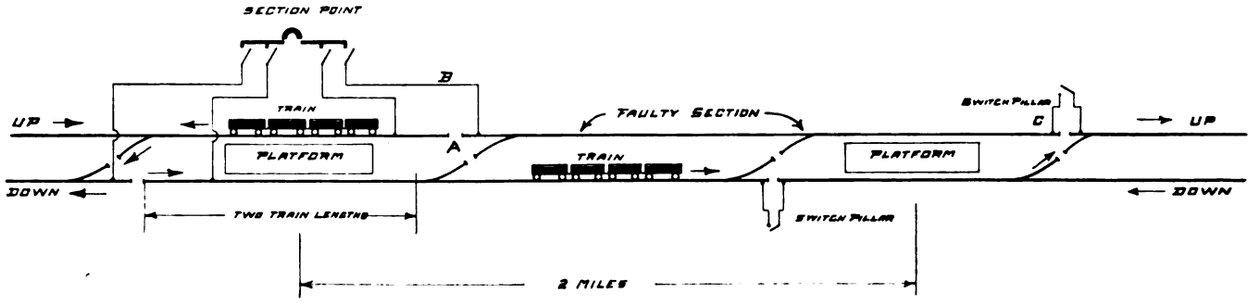

Fig. 3.—Single Line Working Electrified Lines.

Carrying the use of diagrams a stage further, the distributing engineer will find great assistance from an operating key diagram showing the whole system in simple form, mounted so as to admit of movable pieces to take the place of switches or circuit breakers; this on a large system is indispensable, as it enables one to follow rapidly a reconstruction in distribution, and saves a lot of trouble when rearranging methods of feeding. It can also be used as a key, from which instructions can be issued in a few minutes, and it also presents a record of the connections in use from time to time. When trouble arises, the time element is usually of importance, and the means of obtaining data on the spot not always available, hence a diagram of this nature is so useful. A point of some importance, making for simplicity and standardising, is to arrange the switches for up and down lines on the same side of the switchboards; operators facing the boards anywhere on the system should always have the advantage of knowing that this condition applies throughout, and in cases where boards are on different sides of the line or reversed in the cabins, the cable connections should be adjusted so as to keep all boards arranged in the system described.

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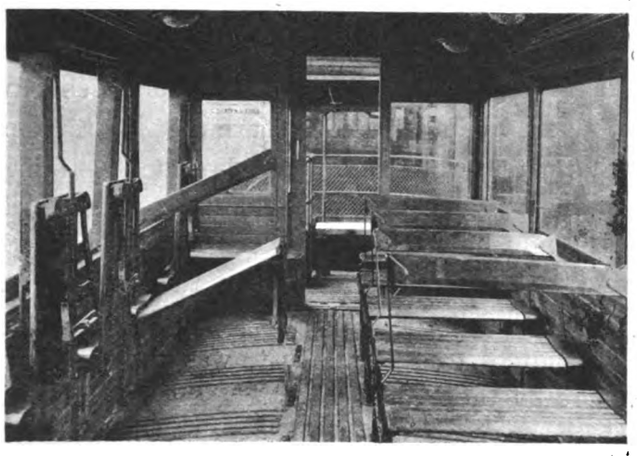
AN UNOBSTRUCTED FLOOR ON THE TOP DECK.

The greatest achievements in modern engineering, and the most efficient machines, are the results of successive improvements in small details, each inventor adding his quota to the whole. A tramcar is the product of many minds, and it is being constantly improved, both in equipment and in seating accommodation.

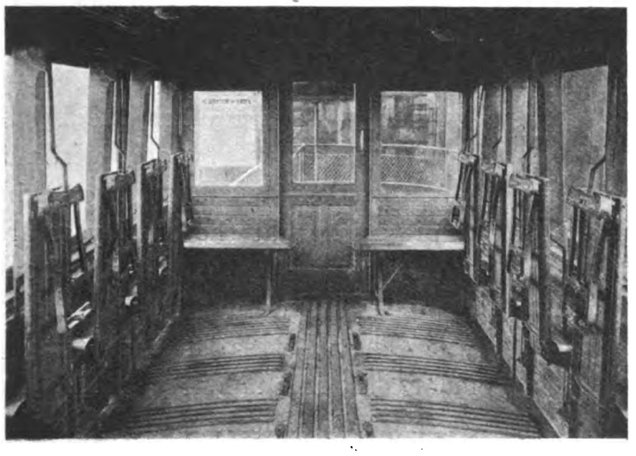
The accompanying photographs illustrate a seat that was designed by Mr. E. S. Rayner, borough electrical engineer and tramways manager of Doncaster,



Seats in Position (on right) and Raised (on left).

a few years ago, and which has been in use on the Doncaster cars for nearly five years. Mr. Rayner designed the seat with the object of making it more convenient for the cleaners to do their work thoroughly. When the seat is raised, as will be seen from the photographs, there is an absolutely unobstructed floor on the top deck, and it is a comparatively simple matter to clean the dirt from the corners.

The seat does away with the pair of legs at the outside edge of the car top, usually a source of trouble



Seats all Raised, giving Unobstructed Floor Deck.

from the number of screws that had to be put in the feet, and it was continually necessary to renew the outside board of the floor on account of rot setting in owing to the wet dirt and the difficulty of cleaning it away. As will be seen from the photographs, the foot of the side support of the seat engages in a pin.

The seats have been adopted at Sheffield and Ilford, and have been found to be of considerable advantage. Further particulars may be obtained from Mr. T. Potts, Greyfriars Road, Doncaster.

THE B.E.A.M.A. ANNUAL MEETING.

The annual general meeting of the Association was held at the offices, 36, Kingsway, London, W.C.2, on March 20, 1919, Mr. F. R. Davenport, chairman of the Council, in the chair.

The chairman, in moving the adoption of the annual report, reviewed the war period, recalling to his audience the sacrifices, personal as well as financial, which were made to secure a permanent peace. He dealt with the many transition questions which would continue to confront the electrical and allied industries before a resumption of normal business could be expected, of which the chief were Labour, the export trade, and the much debated question of the future fiscal policy of the Government. The accounts and report were adopted.

The chairman announced the result of the election to the five vacancies on the Council, as follows:—The British Westinghouse Electricity and Manufacturing Company, Limited; The D.P. Battery Company, Limited; Electromotors, Limited; Lancashire Dynamo and Motor Company, Limited; Nalder Brothers and Thompson, Limited.

Messrs. Price, Waterhouse and Company were re-elected auditors of the association for the year.

During the course of the proceedings, the chairman said that it was with great personal regret that he judged it necessary to resign the office of chairman, which, owing entirely to their goodwill, it had been his privilege to hold for five consecutive years. He was inspired to that resolve solely by the fact that he had held the chairmanship so long, and the expediency, in most undertakings, after such a period, for making way for someone else. He had the great satisfaction of knowing that his successor, whoever he might be, would find himself in charge of a real live organisation, with a loyal and energetic staff equal to any call made upon them. There was no reason to anticipate anything but greater successes still for the Association in the future, and he hoped to be still in close touch with all its work. In conclusion, he thanked the members for their courtesy to him on all occasions and the staff for their loyal service. His relations with everyone had been, he was happy to say, of the most cordial kind.

Mr. C. P. Martin (C. A. Parsons and Company, Limited) and Mr. John Taylor, O.B.E. (Mather and Platt, Limited), in respectively proposing and seconding a vote of thanks to the chairman for presiding, spoke of the great regret with which they had all heard of his determination to vacate the chair He had been in every way an ideal chairman, doing a tremendous amount of work and extending to all comers the greatest consideration and courtesy.

The vote of thanks having been passed with acclamation, the proceedings terminated.

[At the subsequent meeting of the Council of the Association, Mr. W. O. Smith, managing director of Elliott Brothers (London), Limited, was unanimously elected chairman for the year 1919.]

Council's Report.

The report of the Council for the year 1918 contains an impressive record of useful work. Each paragraph in the seven closely printed quarto pages covers a wide range of activities. A summary is given of the labours of the Export Committee in connection with imports and exports restrictions, and the action of the Council in regard to British trading interests in South Africa, Argentine, Australia, Japan, Switzerland, Brazil, Scandinavia, and other parts of the world. In home affairs, the Council naturally took a very active interest, dealing with the Board of Trade classifications of imports and exports, the report of the Ministry of Reconstruction Engineering Trades (New Industries) Committee, precedence of post-war work, pivotal men, report of the Board of Trade Committee on the electrical trades after the war, and other such matters. The Council also accepted invitations to express opinions on the proposals for the erection of super-power electrical stations, and to send representatives to those bodies dealing with the disposal of unconsumed war stores, national kitchens, and electro-culture, and to the Joint Committee set up by the Electrical Engineers' Institution for the creation of a national proving house. The Council has promised support to the Electrical Development Association, the object of which is to educate the public in the uses of electricity by means of publicity. Education and research continue to engage the active attention of the Council, and the Education Committee's report will be issued at an early date. Standardisation, E.E.I. conditions of contract, Port of London conditions of contract, conditions of sale, and other matters affecting the financial interests of the electrical trades have come under the consideration of the Council. Cordial co-operation between the Association and the Institution of Electrical Engineers is maintained. The Council reports with satisfaction that the *Journal* has carried on successfully during the war and has maintained its circulation and influence abroad. The demise of Mr. James Callender, a member of the Council, is recorded with deep regret. The number of members on the register at the end of the year was 216. Forty-five firms were admitted to membership during the year, and three resigned. A table showing the attendance of members at meetings of Council during the session 1918, concludes the report.

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THE
Tramway AND Railway World

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THE EDITOR will be glad to consider articles by experts. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, APRIL 10, 1919.

The Eight-Hour Day.

As a result of much agitation, the representatives of tramway authorities and tramway workers were brought together for consultation on the wages earned and hours worked by tramway employees. After a lengthy period of private negotiation, an agreement was drawn up and accepted by both parties, fixing the number of hours to be worked and the wages to be paid. The full text of the agreement is published in another column of this issue. In the absence of a report of the prolonged deliberations between the three bodies who negotiated the agreement, it is impossible to clear up two interesting points. In other industries a great deal has been said of the desire of the workers to participate in the benefits of what is termed "a fuller life." Nor have they been backward in urging that the shorter working day will benefit the community by leading to the employment of more men. Both objects are commendable, but the conditions of public passenger services have confronted the best-intentioned employers with obstacles that have hitherto proved insurmountable to a reduction of hours of working. The solution has now been relegated to a multitude of counsellors, in that under the agreement the question of spread-over time is left to each undertaking to confer thereon with the representatives of the trade union, with a view to reducing it to the lowest possible minimum. As the consideration of this matter is to be brought forward again for discussion by the national representatives not later than July 1, the officers responsible for the general deliberations may be interested to learn that information of apparent value is obtainable from Australian tramways. Those undertakings have enjoyed the eight-hour day for a considerable period, and in Sydney and Melbourne the spread-over time difficulty is said to have been largely eliminated. That, at least, was the assertion made by the Perth (W.A.) tramway employees on the occasion of a strike last Christmas for the purpose of getting their minimum rate of pay increased to nearly the same figure as is enjoyed in the cities already named. A further grievance was made of the question of broken time being spread over so many hours that the men had little or no opportunity for recreation. It is to be feared that in this country the payment of war bonuses will affect the question of spread-over time. While the bonus exists the men will probably be found not to object to lessened facilities for overtime pay, thus giving scope for engaging more workers. When the bonus ceases they may be desirous of more overtime. To some extent this possible trouble should be eased by the provision that the employees are to receive 54 or 57 hours' pay for the 48-hour week, according to the duration of their old working week. The most satisfactory feature of the agreement is that the unions now recognise that the working expenditure cannot be increased without further calls upon the passengers who keep the undertakings going. In view of what has been done for railwaymen and miners, it is certain that the Board of Trade will not withhold authority to increase the fares, failing which sanction the new conditions are terminable on one month's notice from either side.

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Tramways Finance. Interesting considerations arise in connection with the decision of the Minister-designate of Ways and Communications to exclude municipal tramways from the Bill. As far as can be gathered from his remarks, Sir E. Geddes' action is, at least, partly due to his discovery that "taken all over, these undertakings are earning 7 per cent. on their capital." The only sense in which this statement could be substantiated is by taking the balance between gross receipts and expenditure; when the necessary reductions have been made to meet all liabilities it is doubtful whether the average return spread over the whole of the undertakings reaches 3 per cent. Extending the investigation to individual undertakings, many will be found to earn insufficient to provide for renewals, while some municipal authorities are forced to levy a rate to meet deficiencies. As for company undertakings, which are not handicapped by having to provide an annual instalment for the repayment of their capital, their dividends also fall far short of the aggregate earnings attributed by the Minister to tramway enterprises. Why privately owned lines do not appear to show such good results as some municipal tramways may be inferred from the report of the Board of Trade Committee which inquired into electrical industries. The obstacles therein revealed account for some hindrances that also beset municipal undertakings. The task of removing these undesirable conditions cannot be successfully carried through without resort to Parliament, but as company tramways are to come under the new Ministry, we may assume that the latter body will undertake the initiation of this item in the reconstruction programmes. This particular work is one that need not await the great scheme of placing the electricity supply upon a national basis, which will be of benefit to both forms of tramway enterprise. A considerable time must also elapse before any visible results come from the inclusion of company tramways under State supervision, but there is one respect in which the effect should not be long delayed. That will be in the form of extensions of a rural and inter-urban character, which will be made urgent by housing and agricultural needs. Presumably it will no longer be necessary to pass Bills through Parliament to secure sanction. The Ministry, no doubt, will have power to promote and deal with such proposals, possibly after a local inquiry such as is now held by the Light Railways Commission. This is a matter in which municipal tramways will claim to share in the advantages which the existence of the Ministry will confer. It is conceivable also that the new Department will be able to facilitate experiments in the transport of goods. While strong arguments may be adduced for not seeking to force the municipalities underneath the wing of the Ministry, there are directions in which tramways stand to gain from a co-ordination of railway and tramway interests. The idea is not a new one, for it has long been realised in two Australian States.

Board of Trade's Future. Officials connected with railway, tramway, and electricity undertakings will find their relations with the Board of Trade at an end when the Ministry of Ways and Communications is established. Those relations have been more intimate during the last four years than at any period since electric traction came into being. Early in the war the Board were empowered to grant provisional orders without delay. Although the need for national economy caused the great majority of extension schemes to be deferred until after the war, there were tramway and power projects rendered necessary by war work that were facilitated by the reformed procedure. Then came the appointment of the Board of Trade Committee to inquire into electrical industries, and finally the committee of tramway managers who were charged with the task of attempting to imitate with tramway supplies the miracle of the loaves and fishes. The connection of tramways with the Board of Trade dates from the Act of 1870. As in the case of railways, the Royal Engineer officers who have acted as inspectors of new construction and conducted inquiries into car accidents have discharged their duties admirably. Whether R.E. officers should continue this work, or future vacancies be filled by the appointment of railway and tramway engineers, is a matter that no doubt will engage attention. The railway department was created in 1840 for the purpose of inspecting railways before they are opened for traffic, to inquire into accidents, to

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approve by-laws, and generally to take an active part in all matters which in any way affect the public. Similar duties were allotted in the case of tramways, and in the closing stage of the war an additional task was imposed, namely, of hearing applications for increased fares. The Board, as the first Government Department to deal with Labour matters, has also been concerned in the settlement of disputes on railways, and when the present Prime Minister was its head, in 1911, he had the distinction of introducing the Conciliation Board scheme for the settlement of the great strike. A similar scheme was open for adoption by tramways, but the London County Council undertaking appears to have been the only one by which it was accepted, notwithstanding that it was representative of all grades and secured important concessions, without disturbing harmonious relations. When in November, 1917, Sir Albert Stanley, as an expert in electric railway and labour direction, was called to the Presidency of the Board of Trade, there is no doubt he was soon convinced of the need for the separation of its activities. These have been frequently added to since its establishment in the reign of James I. as a purely trade committee. Sir Albert Stanley's reforming hand has already worked a transformation in its usefulness as a consular commercial agency at home and abroad, and this department alone will prove a monument to his labours when the Board is given the title of the Ministry of Commerce.

Obstructions on London Tramways.

The other morning, a crazy coal-cart broke down across the track on a busy tramway route in London. It was two miles from the centre of the City, and within five minutes the line was blocked for about a mile with stranded cars, and soon the pavement was crowded with hurrying people. A few moments would have sufficed for the drivers and conductors of the cars to remove the obstruction, and the question is naturally asked why they stood idly looking on. The answer is, that they dared not touch a single ounce of the obstructing coal without a mandate from the police authorities. That is the law, and the whole incident is an instructive parable. London County Council Tramways development is obstructed and hampered at every turn by rival authorities and hostile interests. The Metropolitan Police hold power to restrict, divert, or stop tramway traffic at any moment and at every place. Licences for drivers and conductors are granted by the Metropolitan Police, and in numerous other important details they virtually control the operation of the tramway services. Nor are these the only obstructions with which the London County Council Tramways Department have to contend. Scotland Yard is formidable and forbidding enough, but its opposition causes little expense directly. It is otherwise with the hostility of the City Corporation, suburban borough councils, and the various vested interests which have made "dead ends" of many routes, taxed the undertaking with heavy charges, and otherwise rendered operation of the services costly and difficult. At the present moment, the Bills being promoted, seeking powers to carry through improvements urgently demanded, are encountering opposition which it will take thousands of pounds to overcome. London industry and commerce have absorbed the tramway services into themselves and made them vitally necessary to their continued existence. Yet this vital necessity of the greatest city in the world, this interest of a community larger and more powerful than many a nation, is constantly obstructed by hostile interests, subjected to the petty domination of a policeman. London County Council Tramways Authority is called upon to administer a public service of such vast importance, and yet is denied the right to hold rule in its own domain. If power confers responsibility, surely responsibility should confer power to discharge the duties entailed. It is more than time that the obstructions to the development and proper administration of London tramways should be removed and due authority conferred upon those who have the duty of carrying on the business. Here is no question of endangering democratic control, but quite the contrary. London County Council is elected by the ratepayers of London, and therefore commissioned to express the mind of the community. The Council therefore ought to possess unrestricted authority over the whole area served by the tramways, or at least be freed from the interferences and opposition which obstruct the operation and free development of the services.

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THE WAYS AND COMMUNICATIONS BILL.

The Way Smoothed by a Concession.

The much-advertised campaign of opposition to the Ministry of Ways and Communications Bill shrank to very small proportions when that measure came up for the second reading in the House of Commons on March 17. This was largely due to the temperate and convincing statement of Sir Eric Geddes, who introduced the Bill, and by one important concession removed the most serious objection that had been widely felt by members and the public. As a result the Government were able after a two days' debate to secure the second reading without a division. The main principle was thus approved, and the discussion on the Committee stage began on March 27.

The important concession referred to above was the deletion of a part of clause 4, which would have enabled the Ministry simply by means of Orders in Council to acquire railways and other transport undertakings. In consequence of that deletion, the Government will have to promote and carry through Parliament special Bills for any one of these purposes. Thus full and continuous Parliamentary control of the expansion of the powers of the Ministry in this direction is retained.

Sir Eric Geddes had a full house when he moved the second reading of the Bill in a speech occupying an hour and a half, which was well received. It was a plain, practical statement of the transportation problem with which the country is confronted, and it had the unusual result of convincing a number of members whose original intention had, on their own confession, been to vote against the measure.

In introducing the Bill, Sir Eric Geddes said that the problem which we have to face had, he thought, brought before the country as never before the importance of transportation to a highly organised state. We realised, perhaps, in the last year or two that without a go-ahead system, a vitalising system of transportation, the health and housing of the people, agricultural development, settlement on the land, and the industrial development of the country could not possibly be achieved. Housing as a whole was added to those reforms. We were going to make such demands upon the transportation system of the country as had never been made before, and it was right at this stage to consider the conditions, both financial and physical, of the machine upon which we were going to make these demands.

"Except in the one bright instance of the municipal tramways, the transportation systems of this country to-day are not prosperous. There are 279 tramways undertakings in the country, of which 96 per cent. are electrified. That is an important point. It shows that these undertakings are almost entirely modern. Taken all over, these undertakings are earning 7 per cent. on their capital. They are excluded from the Bill. Let us take railways. Before the war the return on railway capital expenditure was 4·3 per cent. It is a loss of from 3 to 4 per cent. on to-day's figures. Light railways before the war made a profit of 2 per cent.; to-day they are working at a loss. Canals, excepting the great Manchester Ship Canal, before the war earned 1½ per cent.; to-day they are working at a loss, and they are heavily subsidised. Roads have practically no income. They cost the country £20,000,000 a year."

The Railway Situation.

Turning again to railways, the Minister said that they were now being worked at a loss of something over £250,000 a day, or £100,000,000 a year. For two years the Government were pledged to continue the guarantee to the railways. Other forms of transportation had either been subsidised or had been given large additional powers of charging. They ought all to be got back to a paying basis. To do that order must be evolved out of chaos. The Government had come to the conclusion that some measure of unified control of all the systems of transportation was necessary. It appeared almost inevitable that to a greater or less extent we must forgo the luxuries of competition; we must forgo private interest and local interest in the interest of the State. In the past private interest made for development, but to-day it made for colossal waste.

Having referred to unnecessary movement of goods on the railways, and to the fact that it was not to the interest of dock authorities to improve their accommodation when the advantage was going to the conveying company, he said that the Government had been forced to the conclusion that, in addition to eliminating competition and restricting the freedom of private enterprise and management, the transportation agencies would be comparatively barren in economy and development until unified control was brought in. It would be nothing short of criminal to let the old system of competition go on. In regard to labour, if they expected discipline among the trade unions they must give the Government a say in the conditions under which labour worked.

"It is no use piling burdens on the railway shareholder. He is not a malefactor. He deserves fair treatment, but he cannot pay any more. He cannot pay what his bill is to-day. We have got to help him. The State must come in and make economies possible.

"Is nationalisation a cure? I do not know. There are those who look upon nationalisation as an end in itself, as something desirable. I am not one of those. I look upon nationalisation as a possible means to an end, a means to an end which you may have to adopt with its disadvantages if the advantages which it secures outweigh them. It is essential in transport that you should ensure continuity of the service, and you cannot have unreasonable stoppages. You must ensure an adequate and efficient service, and if you cannot get that by means of private management, then nationalise."

In regard to the suggestion that railway rates should be put up to meet the present deficit on railway working, he said that that would mean a 70 to 80 per cent. increase on goods rates, and that was unthinkable. The economies which could be effected with a certain amount of unity of control were estimated at about £20,000,000 a year. There was one way, he thought, in which the deficit could be progressively met, and that meant drastic and courageous treatment as a whole. They must introduce economies which were only possible when a comprehensive scheme of settlement could be carried out, and carried out compulsorily if necessary, when they could standardise throughout. Standardisation saved in every way.

Economy of Electric Traction.

"Perhaps the greatest saving of all is the introduction of electricity into our haulage, not electricity such as is used in the multiple-unit system on the tubes around London, but electricity used with heavy electric locomotives. They have been experimented with, and with great success, but we must not commit the folly of our predecessors and allow the development of every system on its own principle, of every system according to the whims and notions of those who introduce it."

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Sir Eric proceeded to speak of the economies possible by traders dealing more rapidly with wagons and by reducing to a minimum the amount of hauling of empty wagons. For the latter purpose the Government would acquire all the privately-owned wagons.

LIGHT RAILWAYS.

"Coming to light railways—they are a comparatively small thing. There are only 836 miles of them. They only earn 2 per cent. Many were authorised, but were not built because they could not be built and be financially successful. Their expenses have gone up, and I think there is no doubt that to-day they must be working at a considerable loss. Their expenses have not gone up as high as on the main lines, but they have gone up very materially. Those railways have been put down with no policy; they are dotted all over the place, and really sometimes one wonders why they are there. They have had nobody to advise, and thus all of us who have been interested in and studied railways all our lives know that they simply go there and eventually become ripe plums to drop into the mouth of the big lines. They cannot exist by themselves, and already I am receiving applications from all sides for advice. They know that I have got a certain number, a small staff, of technical experts, who are helping me, and I am asked for advice on all sides about these undertakings. It has been suggested that the sixty-centimetre Decauville organisation in France might be brought over here and with advantage spread like a network over the countryside. But the maintenance and cost of a Decauville track is so heavy that to put it down in this country for agricultural use would simply be throwing away money. I think there is a possibility of developing the light railway as it has been developed in the rich districts of Northern France and Belgium. I think there is a possibility of developing light electric railways for inter-urban traffic. Decauville railways strewn all over the country, and run by farmers, is a dream. It is a thing that will never exist successfully."

MOTOR TRACTION.

"I think that we must look to the development of motor traction for our agricultural areas. You have there roads of a capital value—I do not know what, and I do not know that anyone knows, but they cost some £20,000,000 per year. Can anyone say that we are getting any value, any return, from that £20,000,000? I do not say you should spend it and look exactly at what return you are going to get out of it, but are we making the best use of property on which £20,000,000 per year is spent? I doubt it very much, and we cannot afford two blocks of capital where one will do. Roads have a greater possibility in opening up these districts than any light railway I have ever met. In this country, for one thing, we do not get the great level stretches we do in France. None of these light railways, I must say, are well equipped. With road conveyances the maintenance will probably be very little higher for dealing with seasonal traffic, whereas if you put a railway down you have got to keep it going all the year. Road services are flexible, and you can move them about, but you cannot move your railway about. When I see the ingenuity with which the motor interest is opposing this Bill, and when I see the picture of the octopus, I wonder what their conception is of a Ministry of Transportation! We had it in France. We had the Rolls-Royce driver in France, who wanted a beautiful smooth road, and we had the Army Service Corps, who said they would be put out of business altogether, but it did not do it. The roads proved there that they were all right, and with your enormous road system in this country I ask the House, when you are going to have a Ministry of Transportation, would it not be criminal to leave it out?"

Sir Eric Geddes subsequently dealt with canals and docks, and pointed out the value of unification of administration, and then referred to electricity supply.

ELECTRICITY SUPPLY.

On this subject he said:—"At first, I agree, it appears a little illogical to put electricity into the purview of such a Ministry as this. But I would ask the House to endeavour to follow me in the conception of transportation which I have been endeavouring to put before them. Transportation is not merely carrying something from A to B. Transportation is the greatest power that we have for bringing prosperity to the community and for developing the district served by it. Is it thought for a moment that a transportation authority would disregard the industrial development of the district through which its lines go? While they were competitive it really was not worth while their making very special efforts to attract trade, because the other men got it as much as they did, and they went on competing. But in the districts where there has only been one big railway system a great deal has been done to develop industry, to attract new industries, and to push the industries of the district. In everything that makes for the prosperity of the district itself it is in the interests of the transportation agency to push it, to take it up, to help it, to foster it; and to suggest that a transportation agency with electricity, of all things, would desire to penalise the manufacturer can only be put forward by anyone who does not understand really what we are after. Everyone knows that the greater the load, the more diverse the load, on a power-station, the cheaper is the power, and the cheaper the power the greater the advantage to the railway that is electrified. It is estimated conservatively that when we get through the electrification of the main lines, which should be done and done promptly—and it will be undertaken if this Bill becomes law—full 20 per cent. of the electricity of the country can be used for traction. But it is not only in reducing the price of the current that we get an advantage. The greatest advantage of electricity is in getting greater density of traffic over the line, so that there is a still further advantage in developing the district that you electrify, and if you consider that the lines of railway are the most direct, the safest, and the easiest of access for the high-tension cables, that it is in every way in the interests of the railway and the transportation agency and the Transportation Ministry to get the electricity pushed down the lines and spread out into the industrial areas, it is really a fallacy to suppose that it would be against the interests of the railways to develop the industrial use of electricity, and far less against the interest of the Transportation Ministry as a whole. The difference between the co-operative use and co-operative production of electricity is enormous, and there is no district in this country where electricity is better organised to-day than the North-East Coast. There the electric power company has worked hand-in-hand with the North-Eastern Railway. There we have a joint organisation—I was instrumental in setting it up—for attracting industry to the district and developing industry in the district. We jointly went in for placing the power-stations near the coal mines and developing the economic use of waste heat. You may say that was against the interest of the railway, but it was not, because it developed the prosperity of the district, and it is in that spirit, and that spirit only, that we must look at this question."

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THE GOVERNMENT PROPOSALS.

In dealing with some of the provisions of the Bill (the text of which was published in our issue of March 13), Sir Eric Geddes said that the temporary powers would all lapse at the end of two years. They could only arrive at a considered opinion after they had carefully and technically examined the possibilities of each class of economy. During the two years the Ministry must have the power to initiate, and, if necessary, to carry through reforms. But until the railways had been told authoritatively and definitely either that they were to go back as independent concerns or that their interests were going to be fused, and they would never go back as independent concerns —until they had been told that, it was not possible to get even the commencement of the economies.

"During the two years we must endeavour to lift the dead hand which is on development. We must endeavour to help it, and help it along heartily, while we are considering the question. At the end of two years the powers under clause 3 lapse, and we shall have to come back to the House. It was not proposed to take any permanent action by Order in Council. Any Order in Council would be discussed in the House. (Hon. Members: "No.") It was thought that that would afford reasonable facilities. But in view of the fact that there is undoubtedly a strong feeling in the House against that procedure the Government will now amend clause 4, eliminating the procedure by Order in Council. On the other hand, dealing particularly with the provisions of clause 4, sub-section (1), paragraphs (*e*) and (*f*), as regards (*e*) the Government will definitely seek power in the Bill to acquire, by purchase or hire, and to maintain, work, or lease privately-owned railway wagons on terms, failing agreement, to be settled by the Railway and Canal Commission under the provision of clause 3, sub-section (5) of the Bill as to temporary arbitration powers. The Government will also seek under the Bill powers to prohibit the use of privately-owned wagons in future, except under licence. It is also proposed to transfer the powers in clause 4, sub-section (1) (*f*), which were permanent powers, and make them temporary powers under clause 3, and to provide that, in addition, during the two years the Minister shall have the right, subject to Treasury control, to construct such works as may be necessary. That is really essential if we are to have legal powers to carry out the scheme—it may be railway development, or something of that kind, which we could not reasonably expect that existing railway companies or other transport agencies would undertake. The Government will have to seek powers at the end of two years to deal with the whole question of transportation. As regards Ireland, it is proposed there, on account of the social and geographical conditions which obtain, that we should set up in Ireland, as part of the Government organisation, a branch of the Ministry which would deal with all Irish questions there. All local matters of purely local interest will be dealt with there. If matters of great importance have to be discussed, it will be the intention of the Minister, or the senior high technical officer, to go over to Dublin to discuss them."

An Hon. Member: "Is it the same with regard to Scotland?"

Sir E. Geddes: "No. Then as regards railways during the two years, we shall continue some such organisation as existed during the war. It is, of course, early days to say how you will organise the railways in the future until you decide the exact form on which they will be worked, but if, as I think is inevitable, there is bound to be a certain amount of central control and unity of control in London, it will probably be found that the best way will be to set up a Chief Commissioner, with possibly other Commissioners here, and divide the country into zones—non-competitive zones —having District Commissioners, partly elected from the district, partly appointed by the Government, and partly drawn from Labour."

Mr. Thomas: "I want to ask if you are disbanding the Railway Executive? Do you mean the Commissioners that you are talking about to take over and exercise the functions of the present Railway Executive?"

CENTRAL CONTROL.

Sir E. Geddes: "The present Railway Executive, or, as I have endeavoured to explain, some body more or less like it, so long as the companies remain in their present position, will have to continue, and in the future, when we reach the more permanent state of railways and of the transportation of the country generally, I think some body of Commissioners will be necessary. I do not think it would be a possible proposition to manage the railways or the transportation direct from the Ministry with executive powers—quite impossible. As regards docks and harbours, there I think it would be a fatal mistake in any way to give up the invaluable services which those great port authorities have been performing, but I think it is essential that some kind of central control, looking at transportation as a whole, should have a right to say to them, 'This improvement is essential in the interests of the community as a whole. It may not be of local interest, but it is essential in the interests of the whole community.'"

Regarding dock administration, he said that the port authorities should have some central body in London. The canals also would have to be dealt with by a Commission. He thought they would be better removed from the railway interest.

ROADS—A SEPARATE DEPARTMENT.

"As to the roads," he continued, "I would propose—in fact I have arranged if this Bill becomes law—that the roads shall be a separate department of the Ministry. The position of local authorities is in no way altered. They will deal direct with the Roads Department in exactly the same way as they dealt with the chairman of the Road Board in the past. I am glad to say that that great road maker to whom the army in France owes so much, and who served under me there, Brigadier-General Maybury, not only is in favour of this arrangement from the point of view of the roads, but has consented to serve as head of the department. He will, under the organisation, have direct access to the Minister."

In conclusion, he said:—"It is upon these lines, and with this conception, that the Government propose to plan and to build. It is admitted that the Bill is far-reaching, that it gives great powers, that the situation, as I have endeavoured to show, is serious, very serious. I do not think it is desperate if it is tackled properly: I do think it is desperate if we pick at it. It is in the opinion of the Government on these lines, with this scope, and only with this scope, with the powers that are given in the Bill, that we can meet the situation. In inviting the House to pass the second reading of the Bill I venture to hope that in considering the grave situation hon. members will rise above the jealousy of road and railways, above the jealousy of the local vested interest—for, believe me, it is not only in the land that there is vested interest—and will subject local pride to the interests of the Commonwealth."

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ARRANGEMENT BETWEEN TRAMWAY OWNERS AND EMPLOYEES.

Terms of Agreement—A 48-hour Week with Payment as for 54 Hours.

The following terms of agreement were arrived at between representatives of the Municipal Tramways Conference, the Tramways and Light Railways Association, and the National Transport Workers' Federation, on Thursday, March 20, 1919, after negotiations extending over several months.

1. (**a**) That the working week shall consist of 48 hours inclusive of signing on and signing off.

(**b**) That with regard to the undertakings working 54 hours or more per week, the employees shall receive 54 hours' wages for 48 hours' work.

(**c**) That with regard to undertakings working more than 54 hours per week, the employees shall receive in respect of the reduced working week wages equal to those received for the number of hours at present worked up to a maximum of 57 hours.

(**d**) That a joint committee be appointed by the parties to this agreement to consider and determine special cases as outlined below:—

(1) Where it is claimed under Clause **1** (**b**) that a special consideration has already been given in respect of a reduced working week.

(2) Where it is claimed under Section **1** (**b**) and/or (**c**) that the normal working week is in excess of six days.

(3) Where a difference arises between the respective parties as to the exact number of hours worked per week.

(**e**) In so far as the Metropolitan area is concerned, 48 hours shall constitute the normal week's work without reduction in pay.

2. (**a**) That every employee shall be guaranteed a working week of 48 hours inclusive of signing on and signing off, or payment equivalent thereto, provided that such employee has presented himself for work at the appointed times on each of the six days, and, further, the employers shall be at liberty to utilise the services of any employee for whom work cannot be found upon the cars, upon such other work as may be considered desirable by the management, subject to such work not impinging on another man's job, and being only of a temporary character.

3. (**a**) That eight hours constitute a normal day's work, subject to local adjustment as agreed, or, at the request of the employees concerned, for working a shift of less or more than eight hours.

(**b**) Provided that if a duty exceeds nine working hours, inclusive of signing on and signing off, overtime to be paid from the expiration of eight hours, and if the day's duty is less than eight hours, but not less than seven hours, ordinary time to be paid for the time actually worked, but if less than seven hours, then the employee shall receive seven hours' pay.

4. That the question of spread-over time be left to each undertaking to confer thereon with the representatives of the trade union with a view to reducing the same to the lowest possible minimum, and the consideration of the same to be brought forward again for discussion not later than the 1st July next.

5. (**a**) That in respect of four National Holidays, viz., Easter Monday, Whit Monday, August Bank Holiday, and Boxing Day, time and a half rates shall be paid; but in regard to Scotland, four General Holidays shall be substituted for the above-named Bank Holidays, to be mutually arranged to meet local circumstances.

(**b**) In respect of Christmas Day (or in Scotland, New Year's Day) double time shall be paid in those undertakings where worked.

(**c**) That in respect of Good Friday, ordinary rates shall be paid, except in those cases where additional rates are paid which shall continue.

(**d**) That in respect of Sunday labour, time and a quarter rates shall be paid, but where additional rates are now paid, such higher rates shall continue.

(**e**) That overtime shall be paid at the rate of time and a quarter for the first two hours and time and a half for any additional work beyond in respect of each day exceeding nine hours, such overtime to be calculated from the termination of eight hours' work.

(**f**) That overtime rates shall be paid over a normal working week of 48 hours; where the general terms of daily duty have been nine hours or less, such overtime shall be accumulative and paid for on a weekly basis at time and a quarter for the first two hours and time and a half for any additional work beyond.

(**g**) Subject to the provisions outlined in Clause **2** (**a**) and Clauses **5** (**e**) and **5** (**f**), a margin of two hours shall be allowed to be averaged on each fortnight, viz., 46 hours minimum and 50 hours maximum in each of the two weeks without overtime rates being operative; but if the working hours per fortnight exceed 96 hours, an overtime rate of time and a half shall be paid, irrespective of whether overtime rates have been paid on the daily basis, on all time in excess of the said 96 hours.

Note.—If the agreed margin be varied in any one week, viz., if 50 hours be exceeded then overtime rates shall commence from the expiration of 48 hours, as provided for in Clause 5 (**f**).

(**h**) In the event of an employee working voluntarily on his seventh or rest day, he shall be paid for such work at the rate of time and a quarter on the rate of pay prevailing that day.

6. (**a**) That six days' holiday with pay annually be granted after 12 months' continuous service, with an additional two days for the year 1920. In the meantime the question of holidays shall be referred to the Joint Industrial Council for decision.

(**b**) That this arrangement with regard to six days' holiday shall date from the present year.

(**c**) That the holiday period shall, as far as practicable and subject to local conditions, be granted between the 1st April and the 31st October in each year.

(**d**) That in calculating holidays for the purpose of payment, rest days shall not be included.

(**e**) That no employee shall be entitled to payment in lieu of holidays.

7. (**a**) That depot day staff employees shall be granted a working week of 47 hours at existing weekly wages.

(**b**) That depot night staff employees shall be granted a working week of 48 hours at existing weekly wages, such hours to include a meal time allowance of not less than 30 minutes each night.

(**c**) That the maximum number of hours to be paid for in respect of the reduced working week, referred to in **7** (**a**) and **7** (**b**) shall be 57, except with regard to the Metropolitan area, where the normal working week has been in excess hereof.

8. (**a**) That the terms of this agreement, so far as they affect the new rate of pay, payment for overtime, and extra work, shall operate as and from the commencement of the working week terminating prior to the first day in April, 1919.

(**b**) That the employers shall use their best endeavours to bring the whole scheme for a reduced working week into operation as soon as they can obtain the necessary labour to enable them to do so.

9. That the recommendations contained in the preceding paragraphs are subject to powers being granted by the proper authority to increase fares, now limited by statute or otherwise, before 30th June next, and that failing the granting of these powers by that date, this agreement shall be terminable on the receipt of one month's notice from either side.

10. That nothing in this agreement shall operate to the prejudice of any privileges or emoluments or conditions of service which an employee in an undertaking is now in receipt of.

11. Permanent way employees, whose services are of a temporary character, shall be excluded from the provisions of this agreement.

12. That in the event of any dispute arising between the parties hereafter as to the interpretation of any portion of this agreement, the same shall be referred to the Joint Industrial Council, or, pending the formation thereof, the joint committee referred to in Clause **1** (**d**) for settlement.

13. Provided that this agreement shall not apply to employees whose wages and conditions of labour are governed by other trade union agreements and awards.

RAILS FOR BIRMINGHAM TRAMWAYS.

According to the programme of reconstruction on the Birmingham Corporation Tramways, about twelve miles of single track are to be reconstructed. In their report the Tramways Committee said that it had been impossible to purchase rails in this country during the war. In February, 1919, an offer of rails was made by the Lorain Steel Company, who had previously supplied rails of a satisfactory quality to the City Council. An order was accordingly placed with the Lorain Steel Company for 1,000 tons. The committee advertised for tenders for a further 1,000 tons. Only three tenders were received, two from English firms and one from an American firm, the Lorain Steel Company. The latter firm, in addition to quoting the lowest price, offered full delivery April-May shipment, and their tender was in accordance with the usual specification. The next lowest tender contained the following statement:—"We are sorry we cannot undertake the delivery you stipulate—10 weeks; but we should probably be able to make delivery of about 50 tons a week, commencing in three or four weeks' time." The third firm, whose price was £2,000 higher than the lowest tender, could not deliver under twenty weeks. In the circumstances the Committee felt that they had no alternative but to place their order with the Lorain Steel Company.

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ELECTRIC WELDING AND ITS APPLICATIONS.*

By Walter Leonard Lorkin, A.M.I.E.E

Introduction.

Electric arc welding passed out of the experimental stage into the practical stage many years ago, but in spite of this fact, the subject is still rather vague to many people. It plays an important part to-day in the manufacture and repair of many articles. Some have hesitated to adopt the process, because they failed to see its advantages and doubted its efficiency. They did not appreciate that, by installing a small electric plant, they had at their disposal a ready means of carrying out work which had previously been beyond their power. They further, no doubt, thought that the plant and apparatus employed were complicated, and required extreme skill in handling, and probably thought that the amount of benefit gained would not be sufficient to justify the original outlay.

The object of this paper is to show to engineers and others that the process is simple, that it can be carried out with ordinary labour, and that the welds are efficient and effected at small cost. In miscellaneous shop repairs the cost of welding ranges from 1 to 10 per cent. of the value of the article repaired.

The pressure or resistance method of welding was invented by Elihu Thompson, and commercially produced about 1880. Resistance, pressure, or contact butt welding is an operation where two pieces of metal are brought to the plastic state by passing a heavy current of electricity across an imperfect contact, when, by means of pressure, the weld is effected. The parts are placed in position so that, the welding temperature being reached, consequent increased pressure establishes their union; the weld is generally hammered during cooling. The system is commercially successful, and has been largely used in the production of many parts for years past. In order to obtain the large amount of current which is required effectively to weld even small pieces, it is usual to employ an alternating current transformer. This is incorporated in a special machine, which consists of a clamping device, by which the heated surfaces may be brought together directly they are raised to the correct welding temperature. The transformer is of the ordinary double-wound type, having a primary winding suitable for the supply voltage and periodicity of the circuit, whilst the secondary is a single turn, and is usually in the form of a large copper or bronze casting. The current produced in the latter has, generally, only a pressure of a few volts, whilst the current may be many thousands of amperes. As this high current cannot be conveniently carried for any distance, it is usual to form a clamp for holding the work directly upon the ends of the secondary winding, so that the circuit may be as short as possible. To deal with the many shapes of commercial parts, the welding apparatus must consequently be designed for the various demands.

One of the most popular of these designs is employed in the joining of bars end to end. The clamps are fitted upon the bars about 3 in. away from where the union has to be effected; the hand lever is then applied, thus bringing into contact the two surfaces to be joined. The current is then switched on to the primary of the transformer, and the heat consequently generated at the contact softens the metal. Further pressure, applied by means of the hand lever, causes the two surfaces effectively to weld together, and to form a bulge round the joint. The current is then switched off, and the work removed. In the larger sizes of these machines the pressure is applied by hydraulic means, and the electrodes, or clamp ends, are often water-cooled, to prevent their heating up through continuous use.

Electric Spot Welding.

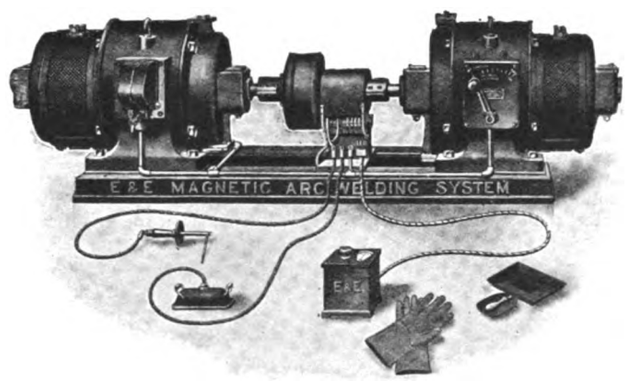
A development of this process is known as spot welding, and its particular application is for the joining of thin metal sheets, wires, or plates together, by means of a series of spot welds, thus replacing riveting. The operator places the metal sheets upon the table over the lower or stationary electrode so that the overlap or joint occurs in the correct position. He then brings the upper electrode down upon the work at the spot where the weld is required. Heat is at once generated, and the two plates are pressed together by means of the upper electrode. The pressure is then released and the sheets moved into the position for the next spot weld. Under this system it is possible to produce as many as six or eight spot welds per minute, according to the thickness of the plates and the character of the work. The system has also been applied to the welding of rail ends. The machine for this work is shaped like a large inverted U, carried above the rails by means of a crane.

Requirements of the Arc.

It is well known that an arc is formed by touching two contacts or poles of an electrical supply circuit, and withdrawing them slightly. An arc is thus established which, in burning, consumes the electrodes. The temperature of an electric arc is the highest known, exceeding 3650 deg. C. The positive pole is about 1000 deg. in excess of the negative. At the moment of striking the arc a virtual so-called short circuit is formed, which permits a rush of current far exceeding that afterwards consumed in the arc. This high-value current would, uncontrolled, produce evil effects, such as the melting of fuses and the opening of circuit breakers, besides imposing great strain upon the generating plant. Therefore it is necessary to introduce some means which will prevent this, or at all events limit it to reasonable values. This can be carried out by various methods. The best-known and perhaps most widely-used method is to insert in the circuit an amount of resistance which will only allow the current to rise to a safe value on striking the arc. Unfortunately, the resistance has to remain in the circuit the whole of the time the arc is working, and wastes a considerable amount of energy by converting it into useless heat. The amount of resistance is governed by a law relating to the permissible rise of current at the arc. Fifty per cent. is about the highest value which can safely be used, and this entails that approximately the same amount of energy should be consumed in the resistance as in the arc. As the arc voltage is about 25, the supply should have sufficient pressure to equal this and that consumed in the resistance. With the 50 per cent. rise named, 25 volts must be the pressure across the resistance, so that the supply pressure will not be less than 50. Where higher voltages are used (and there are many cases in actual working), the loss in the resistance, or stabiliser, as it is often called, is even greater, and may be twice and even three times that consumed in the arc. The author has found many cases where 110 volts are used, and in several instances 200 and even 210 volts. As only 25 volts are used in the arc, it is apparent that the remainder are absorbed in the huge resistance and dissipated as useless heat. Obviously, if we are to work economically, we should employ the lowest line voltage at which we can carry out efficient work. This loss or inefficiency in arc welding, is a serious feature, but it can be obviated in various ways.

The Voltage of the Welding Arc.

The voltage between a ferrous metal electrode and the iron or steel operated upon will be found generally to vary from 18 to 25 volts. The variation is due to the operators, who hold different lengths of arc, according to their individual method of working. Twenty-five volts is the most common figure, although many of the best workers prefer to retain the arc at 23. To draw an arc over 27 volts results in bad work; flaming occurs, and there is the liability of bubbling in the molten metal.



Motor Generator Arranged for Welding.

The lowest voltage at which the arc can be maintained for any length of time is about 18, but its employment depends upon the character of the metal forming the electrode and the flux, as a softer metal or ferrous alloy will vaporise at lower temperatures, and furnish conductive gases, thus allowing the arc to be established at lower voltages.

In the alternating current arc the author has found the voltage across the arc to be slightly higher. This is probably due to the fact that it is impossible to hold a short arc, owing to the peculiar way in which the metal falls in globules from the electrode. The voltage, therefore, with alternating current is about 30 volts, although it is continually fluctuating as the globules form and fall. It is well-known, however, as shown by the investigations of the late W. E. Duddell and others, that the electrical arc, by its rapid variations of resistances, produces oscillation effects at a very high frequency.

Carbon Arc Welding.

Electric welding, using the carbon arc, is the older of the two main systems in autogeneous welding, and was originated by Benardos over 30 years ago. In this system, graphite carbon electrodes are used, and they vary from ¼ in. to 1½ in. in diameter, and from 6 in. to 12 in. or more in length. They are pointed so as to focus the work as much as possible. The sizes vary according to the class of work to be done. The carbon is mounted in a suitable holder, and it is

* Abridgement of a Paper read before the Royal Society of Arts on March 12, 1919.

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attached to the negative pole of the supply, the positive being attached to the work. It is very important to observe that this polarity is maintained correctly, as if it is reversed molecules of carbon will be conveyed from the electrode to the work and incorporated in the newly-deposited metal, rendering it very brittle and difficult to machine subsequently.

The process of carbon arc welding is employed for the filling of holes in castings and in the cutting of metals. The carbon arc in such cases supplies the heat, the filling metal being provided by a metal bar fed into the arc. Fig. 1 shows an operator at work with this process. With the carbon arc it is necessary to have 45 volts or more, and from 100 to upwards of 600 amperes, the variation

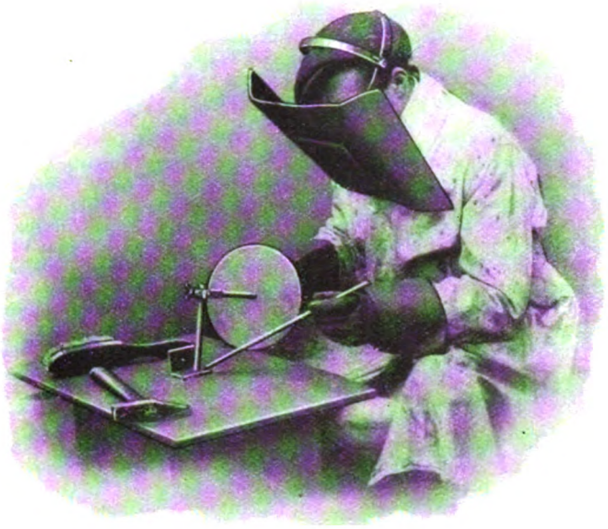

Fig. 1.—Welder at Work.

being decided by the class of work and speed at which the operation is to be conducted.

Carbon arc welding has its own particular sphere. It is especially suitable for rectifying steel or malleable iron castings rendered defective through the presence of blowholes and other imperfections. It has also the power of washing out sand from internal hollows and replacing it with new metal, applied from a wrought-iron bar in the other hand of the operator. When skilfully done, these blowholes can be so filled up that no trace remains. The value of carbon arc welding in the foundry is thus evident; an imperfect casting is no longer food for the scrap-heap, but is an object to be perfected. Another advantage is that holes can be quickly produced in iron or steel plate by holding the arc over the spot until the metal melts

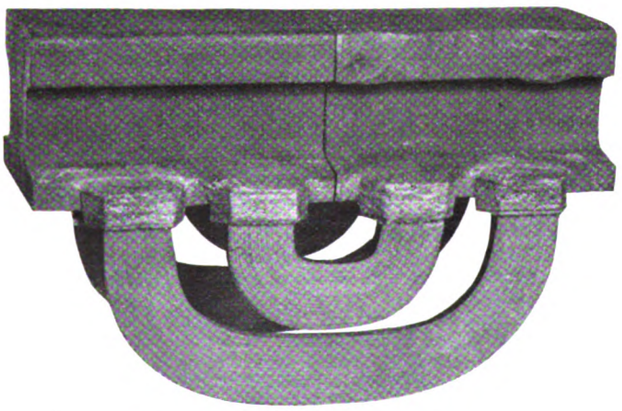

Fig. 2.—Bonded Conductor Rail.

right through. Thus it forms a quick and cheap substitute for rough drilling.

The repair of holes worn oval in machinery is another sphere for the employment of the carbon arc. For example, take a tramcar part, with such a hole. In the centre, the oval hole is filled in with new metal, and at the side a hole is redrilled to the correct size. Thus, by this means many parts which would otherwise have to be scrapped can be reclaimed and used again. In the tramway and railway world there is much work of this character to be done, and here the importance of electric arc welding cannot be over-estimated. Fig. 3 shows an operator effecting repairs to a tramway rail joint.

Electric Bonding of Rail Joints.

Another field for the use of the carbon arc is in copper bonding of rails for electric traction purposes. The welding of bonds across rail joints is an American feature. Fig. 2 shows a copper bond, of large section, fitted to a conductor rail of an electric railway system. The bond itself consists of laminated copper strips. The carbon arc, directed upon the ends of the copper strips, melts them down, and welds the copper bond to the steel rail. Further supplies of copper can be fed in from a copper melt bar, held in the left hand of the operator. By this process, the molten copper is burnt into the edge of the rail. The same process is then repeated at the other end of the bond, thus forming a solid copper weld at the edge of the rail.

There is an enormous advantage in this system of bonding. The ordinary method of attaching bonds entails drilling holes in the rail and fitting the ends of the bonds with taper pins, driven in from the other side. Bonds thus fixed are liable to work loose under traffic conditions, the connection is consequently imperfect, and a dangerous fault in the system arises. With the electrically-welded bond this danger is entirely absent, as perfect electrical connection is made, and the necessity of drilling holes is avoided. Not only is there a great saving in labour by this process, but there is also the saving of energy otherwise lost in defective rail circuits.

Fig. 3.—Operator Repairing Tramway Rail.

Cutting Metals by the Carbon Arc Process.

The carbon arc process is also largely used for the cutting of metals; but the work performed is not as neat as that done with an oxy-acetylene blowpipe. This is due to the fact that the arc oscillates from one side to the other, thus melting the adjoining edges of the metal. The actual cutting is accomplished more quickly with the electric arc when dealing with metal up to 1¼ in. in thickness. Its value in cutting up scrap metal and in demolition work is thus evident.

Metallic Electrodes.

Metallic electrodes are a comparatively recent introduction in electric arc welding, and apparently were originated by Slavinoff in the year 1895. Here the necessary filling metal is supplied by the metallic electrodes themselves as they melt, and this simplification of the process of welding indexes an important advance. This stage, however, was not final. The rapid cooling of the metal from the electrodes, coupled with a considerable amount of oxidisation, tends to make the deposit brittle and spongy. This immediately suggested that some form of flux was necessary to assist the process of fusion. Kjellberg, about 1897, introduced a flux for metallic electrodes, and later Mr. Strominger, of London, developed an elec-

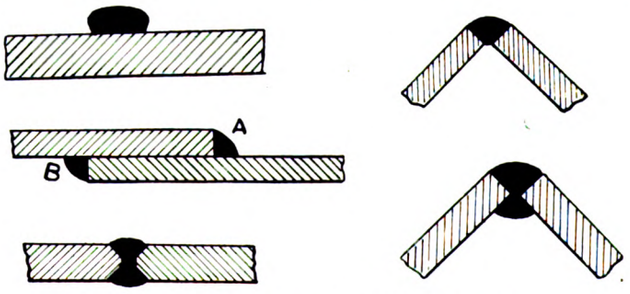

Fig. 4.—Typical Examples of Welded Joints.

trode already fluxed. Various fluxes have, from time to time, been developed and can be applied either by laying them upon the work during the process of welding, or coating the electrode itself with the flux material. The latter has found preference, mainly because the right amount of flux is conveyed to the arc as the welding proceeds. These fluxes generally consist of silicates, the fusing point of which is high and which, as heat-resisting agents, furnish a desirable coating over the newly-deposited metal.

Coated electrodes have now become a commercial article with a competitive market. They are sold in bundles, ready for use, in various gauges.

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Electric welding is very similar to oxy-acetylene welding, in that a V groove is formed at the joint, into which the metal is deposited. In Fig. 4 is shown a plain butt joint, V'd both sides, with the metal deposited, the black portions showing the latter. It will be noticed that there is a resulting increased thickness of the plate where the weld occurs. This is considered a permissible feature in welding and enables the original strength of the plate to be maintained. By piling up the metal in the manner shown, the strength of the weld can be made greater than that of the plate itself. To the right is an angle joint constructed in a similar manner. It will be seen that the plates automatically form a V groove of 90 deg., without any special preparation, suitable for depositing metal into. It is essential that the edges of the plates, before welding, do not meet,

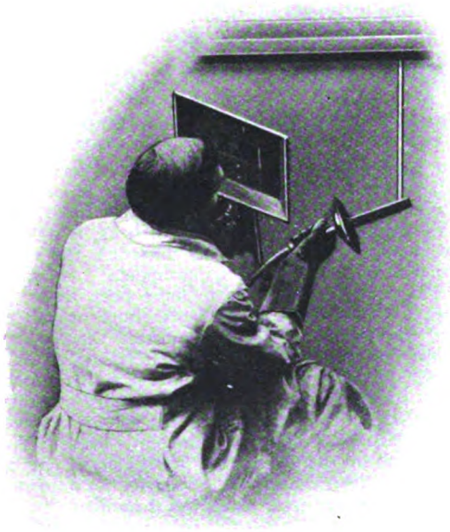

Fig. 5.—Overhead Welding.

otherwise the newly-deposited metal will not pass through to the other side. The centre left-hand sketch in Fig. 4 is a lap-joint welded at both the upper and lower edges of the seam. This joint is commonly used in ship construction, and has the advantage that it caulks the joint automatically at the same time. These three joints are typical of the great majority of work carried out, but many other types will, no doubt, be suggested. Another feature of the metallic electrode is that it is possible to weld vertical and even overhead seams. Both these processes, however, are slower, and require more skill than downward welding.

Welding a vertical seam is more difficult than downward welding, and the process is slower. The operation is started at the bottom of the seam, and the metal gradually built up. The deposited

Fig. 6.—Welded Links.

metal is frequently hammered to consolidate it and give a better appearance.

Fig. 5 shows the operation of overhead welding. This is the most difficult of all positions, and needs expert skill. The making of vertical and overhead welds is largely a matter of experience, and an expert operator will so play his arc that the metal has time partly to set. It is impossible in overhead welding to do so neat work as when the welding is downward. Considerable hammering and caulking is necessary to consolidate the metal and to remove the globules which remain, due to the action of gravity, when the metal is in a semi-molten state. It is, however, quite possible to make satisfactory overhead welds (a number of examples of which, together with others, were exhibited by the author).

Alternating Current.

The facilities which exist for the transmission and transformation of alternating current would imply that this current is particularly suitable for welding work. The fact that the current can be conducted to the location of welding operations by small wires conveying current at high voltage, and there converted by means of static transformers to a pressure suitable for the welding arc, indicates the great advantage to be derived. A disadvantage, however, is found in the arc itself, which is not so stable at low voltage, and cannot be so easily handled as the direct current arc. Further, alternating current is not so efficient as direct current. The voltage between the electrode and the work is nearer 30 than 25, and it is necessary to have a considerable reserve of voltage in the supply circuit to maintain the arc.

Types of Supply and Generating Plant.

Electric current for welding can be drawn from any suitable supply, providing it is ample to meet the demands, and is of the correct voltage. Very few public supply undertakings will permit current to be drawn from their mains for direct use in an arc for welding purposes. As the current is usually 100 amperes and upwards, the sudden demand of the welder would submit a strain upon any system to the detriment of other neighbouring consumers. Another drawback is that practical welding work often requires one pole to be earthed, and as large masses of work (boilers, for instance) cannot be effectively insulated from the ground, such earthing would not be allowed by the supply company. When, however, a transformer or motor generator is imposed between the supply and the arc an amount of flexibility which eradicates or smooths out the erratic demands of the welder is thus secured which removes the trouble due to earthing. Further, few supply companies furnish current at a voltage lower than 200. This would entail great loss in the current-limiting resistance or stabiliser above referred to. Current, however, can be taken from the consumer's own generator, which should be wound to give a voltage of 60, to enable the arc to be efficiently supplied. Such machines can be made to feed any number of welding arcs in parallel, and may be driven by any form of steam or internal combustion engine. The engine, however, of whatever type, should have sufficient fly-wheel effect, and should be fitted with a sensitive governor.

The welding generator should be evenly compounded. The welding load is, perhaps, the worst form of load which the generating engineer has to cope with. It is worse, in fact, than many traction loads, and the plant, therefore, must be constructed of such a type as will meet these extraordinary demands. An ordinary dynamo of the type to meet a lighting load would be quite unsuitable for welding purposes, owing to the fact that it is not designed to withstand the enormous strains imposed upon it. A shunt-wound dynamo is obviously unsuitable, owing to the severe dropping characteristic, and the nature of demand, for, upon striking the arc, there is obviously a heavy rush of current, which brings the voltage to a very low point, from which it has to be built up again

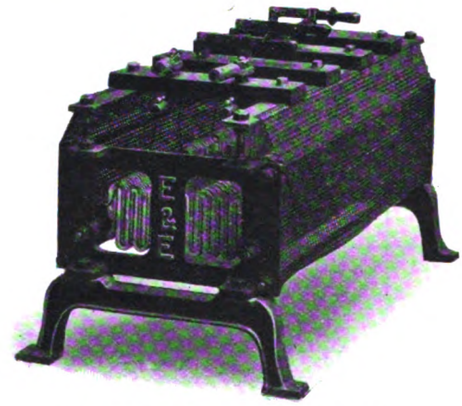

Fig. 7.—Taper Type Resistance.

for the welding current. Where such a machine has already been put down erroneously for welding work, the fitting of a separate exciter will, to a large extent, establish its suitability.

Motor-driven Generators.

Where the electric supply has to be transformed for direct current welding work, the converting apparatus may be classified as follows: Taper or parallel path resistance, rotary converters, double-wound armature machines, plain motor generators with fixed couplings, motor generators, reducer balancer sets, motor generators, with magnetic automatic slipping clutches. The majority of these are so well known that the author only proposes to describe in detail the last-named.

Where the voltage of the circuit is consistent at 60 or 110 volts, a resistance is necessary to limit the current in the manner above described. Usually there are two types of resistances or stabilisers in use. One is the taper type of resistance shown in Fig. 7.

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Motor Generators with Magnetic Automatic Slipping Clutches.

This is a recent development of a motor generator, having an automatic slipping clutch, or magnetic coupling, which is differentially wound. This clutch is the invention of Messrs. W. L. Davies and A. Soames, and is called the "Daysohms." The great advantage of this clutch is that the use of the current limiting resistance is entirely avoided.

Fig. 8 shows a section of the clutch. The motor, or driving end, is on the right, and carries the body of the clutch. This is really a rotating pot form of magnet, having the poles at point M. G is the yoke which is supported on a driving plate mounted on a radial

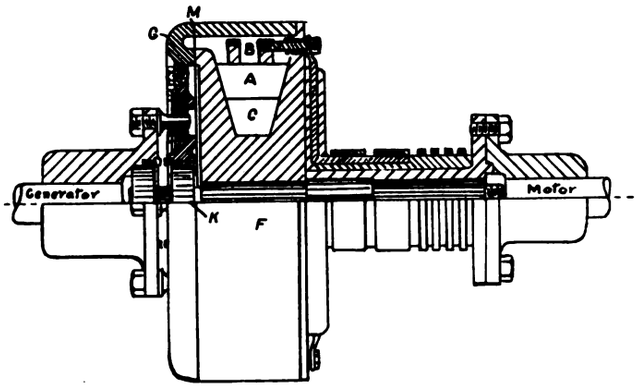

Fig. 8.—Section of Daysohms Slipping Clutch.

ball-bearing K. The dynamo shaft on the left carries a coupling, with pins, engaging in bushed holes in the driving plate, and also another ball-bearing to support the weight of the body F. The energising coils are situated at A, B, and C. A is the main magnetising coil of fine wire, energised from some convenient constant potential source, such as the motor-driving supply, and magnetising the clutch in a direction which we will call positive. B is a few turns of heavy copper strip, carrying the whole of the welding current, and magnetising in the opposite direction to A, or negative. C is another fine wire coil which is connected as a shunt across the dynamo terminals. This is also connected in a negative sense, so that B and C tend to operate against, or weaken the flux due to A. Upon

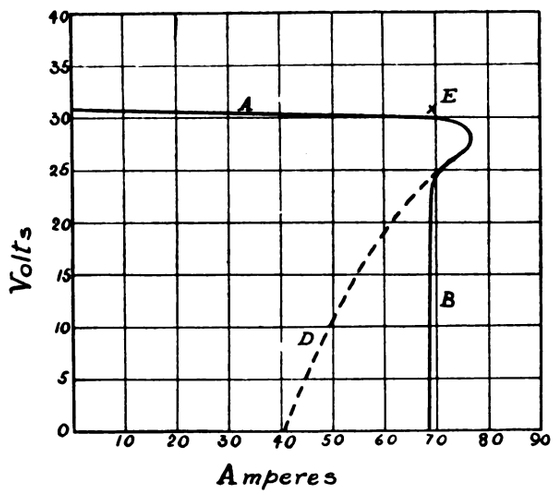

Fig. 9.—Characteristic Curve of Machine Fitted with Slipping Clutch.

starting the machine, coil A is energised so that the clutch revolves as a solid piece, and with the dynamo exciting (it is separately excited from the motor supply) coil C comes into operation, weakening the clutch hold to a certain degree. Upon striking the arc, current flows through coil B, and if the current exceeds a certain amount, the combined effort of B and C will neutralise the flux due to A, and the clutch will slip.

Fig. 9 shows the characteristic curve of a machine bearing this device. It will be seen that the current here rises to 70 amperes, at which the clutch is set slip. Owing to the peculiar behaviour of the law governing the co-efficient of friction, the clutch would hold on too long, and on slipping the power would fall right off, the current descending down the dotted line D. It is here that the advantage of coil C is evident, for, as the dynamo speed falls, due to the slip, its volts descend, and the effect of coil C in its demagnetising properties becomes less. This is equivalent to strengthening the flux due to A and allowing the clutch to regain its hold, so that the current falls down the vertical line C. E is the point of operation, so that no slip occurs, except upon the operator shortening his arc, or otherwise raising the current. The nose seen in the curve is of great advantage in working, as it enables the operator to strike the arc with ease. By means of small rheostats, the currents in coils A and C and their consequent magnetic effects can be varied, thus giving the operator a considerable range in current values.

The whole of the apparatus and accessories used by the author were manufactured at the works of the Equipment and Engineering Company, and the examples of welds were made by their own operators. The specimens of spot welding, however, were lent by Messrs. The Electric Welding Company, Limited, and Messrs. The A.I. Manufacturing Company. The author has also to thank Messrs. Davies and Soames for permission to include a description of the "Daysohms" clutch, which is incorporated in the "magnetic arc welding system" as made by the Equipment and Engineering Company.

LONDON TRACK AND CAR DEFECTS.

Effects of the Shortage of Materials.

That a long time must elapse before tramway services can be restored to the pre-war standard is shown by reports recently presented by the Highways Committee of the London County Council. At the authority's meeting on March 25, it was reported that owing to the shortage of repairing materials the number of cars in service was 86 short of the requirements. As regards the car shortage, good progress appears to have been made, judging by the Highways Committee's report, presented at the meeting of the Council on March 4. The Committee therein explained that the present time-table requires 1,244 electric cars (amounting with 20 per cent. spares to 1,493 cars), and 114 trailers (amounting with 5 per cent. spares to 120 cars). On February 20, 1919, only 1,049 electric cars and 114 trailers were in service; there being therefore 195 electric cars short of immediate needs. The total numbers of cars held by the Council are 1,662 electric cars and 158 trailers, so that the electric cars out of service for repairs exceed 600—approximately 40 per cent. of the total number.

The shortage from present time-table requirements has developed during the past few weeks, as a result principally of an unexpectedly large number of breakages of axles. During 1914—when the average number of cars in service was larger than now—only 127 axles broke. During the short period from January 1 to February 12, 1919, the number of axle breakages was 288. The rate was particularly high during the recent frosty weather, and the high average during this period is attributed partly to the overloading of cars under present conditions at times of heaviest traffic, and partly to the depreciated condition of the rolling stock, as a result of the heavy use to which it has been subjected over nearly five years—in which period abnormal conditions caused by the war have made it impossible to maintain the former high standard in connection with car repairs and renewals. Every effort is being made to overcome the present car shortage.

During the war many cars have had to be depleted of available parts unobtainable from outside sources to replace broken or worn-out parts on service cars. The manufacture—practically discontinued during the war, except for munition purposes—of malleable iron and steel castings and forgings is being resumed, but, as all undertakings are pressing for the same materials, delivery is slow. Stores and equipment of all kinds, required for maintaining cars in serviceable condition, continue in short supply. The time within which it will be possible to meet the present time-table requirements depends on the rate at which supplies of these commodities are obtainable.

The general manager had advised the committee that unless he had greater facilities for obtaining supplies he saw no prospect of making a greater number of cars available. Opportunities of obtaining supplies are frequently lost owing to the unwillingness of contractors to quote except for immediate acceptance. The Highways Committee decided to make temporary arrangements in order to facilitate the acquisition of stores and materials up to October 31, when they will again review the whole position. Under the temporary arrangements, which were agreed to by the Council, the general manager is authorised to open tenders where the estimated expenditure is £500 or less, and to accept any such tender or quotation provided that his action be reported to the committee in a form showing separately (1) tenders or quotations resulting from competition, (2) quotations invited from one firm only in each case, (3) unsuccessful invitations of tenders or quotations, and (4) orders placed on emergency without tenders or quotations having been invited.

Replying, at the Council's meeting on March 25, to criticisms at a Newington inquest on the condition of the tramway track, Mr. Hume, chairman of the Highways Committee, stated that the Council were not responsible. The Highways Committee had frequently reported on the impossibility of obtaining either the rails, the road material, or the labour required to put the track in proper condition.

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DIFFICULTIES OF TRAMWAY OPERATION DURING THE WAR.

A MEMORANDUM BY MR. J. B. HAMILTON,
General Manager, Leeds City Tramways.

The following is a memorandum presented by Mr. J. B. Hamilton, general manager of Leeds Tramways, to Leeds Corporation Tramways Committee, setting forth the chief difficulties in providing adequate service during the war and under post-war conditions. The memorandum was compiled for the information of the tramways committee and was subsequently published at their desire in the local press, in order that the travelling public might understand how serious have been the difficulties encountered. We give the document in full, as it deals with conditions that have prevailed generally throughout the country :—

The difficulties affecting city transport in all parts of the country have been gradually increasing, but it is now hoped that they have reached the climax. In every undertaking in the United Kingdom, but more particularly in those which serve big industrial populations, the same factors have been met. These are the large number of men employed as motormen and conductors whose physique has been found acceptable to the medical authorities of the army, and, secondly, the enormously increased demand upon the carrying capacities on the various routes. For some months past the inhabitants of all the large towns have been very much inconvenienced by the paucity of service. Many criticisms by irate would-be passengers have been passed upon those in control of undertakings, and no doubt the inconvenience existed, but the causes which produce it have been absolutely beyond control. Statements have been issued by the tramways committee in many towns, such as Manchester, Sheffield, etc., explanatory of the deficiencies of the service, and it is for the same reason that the following brief summary of facts relating to the City of Leeds is now set forth :—

Beginning with the recruiting of the staff of motormen and conductors, these numbered 1,112 at the commencement of the war. Of this number 772 have gone on active service during the war. The total number in the service in January, 1919, was 956, of whom 396 were female conductors. It will be observed that whilst the personnel must be to a large extent new, that a reduction in the total number of 156 has occurred in spite of every effort to keep up the numbers. The provision of a service of vehicles on tramways differs entirely from the carrying out of work in a factory where any duty not completed can be taken over for the next day. It is necessary, therefore, as the service must be maintained, to have, if at all possible, a considerable number of spare employees who can take up duties should the regular employees be absent. The extraordinary severity of the weather and the presence of a virulent form of influenza, and no doubt other causes, resulted in an increase from 1914, when there were 45 people absent from sickness, to the same period of 1919, when there was an average of 193 absent. The number, of course, fluctuates from day to day, and as a matter of fact on some mornings over 200 employees were unable to turn out to their duties on account of sickness.

The great scarcity of materials and labour caused the maintenance of cars to be very much delayed and probably not so completely executed as under normal conditions. The considerable overloading and the large number of less experienced drivers has further accentuated this. In January, 1914, an average service of 220 cars per day was given. In January, 1919, this had fallen to 206. The number of journeys missed, however, is very much greater. In January, 1914, the number was four ; in January, 1919, this had risen to 70.

The comparison of passengers carried with the decreased number of cars shows that in January, 1914, a total of 7⅜ millions were carried. With an average of 14 less cars per day, a total of 9¾ millions were carried in 1919, a *pro rata* increase per car of 37 per cent.

The two unusually severe snowstorms which visited the district in December and January last have created a tremendous amount of extra work in the repair of cars. In weather of that character the water and snow is splashed into the electrical parts and creates short circuits. Not only is the number of cars rendered *hors de combat* doubled, but the damages due to this class of weather, being principally in the electrical portion, require a very considerable amount of repair. At the present time the repairs to the armature portion of the motors is far behind the requirements, notwithstanding that repairs have been carried out by the staff in the depots and in several parts of the country wherever it is possible to get makers to take up the work. The extraordinary increase in this section of the work is shown by the following figures :—In 1914 67 armatures required re-winding ; in 1918 this had increased to 217, or an increase of 224 per cent. As compared with 1914, the total number of cars which for reasons of scarcity of material or labour are unable to be repaired and put into service has increased by 20 per cent. Although application has been made in many directions for demobilisation of pivotal men required for constructing and repairing cars and permanent way, a very small number has yet been returned. The principal reasons for the large number of cars being laid up in the depots are as follows :—

Armatures.—This is one of the most serious troubles in motor defects, chiefly due to faulty driving, bad track, and overloading, and has been such that our present staff of armature winders has been unable to cope with the work. We have therefore been compelled to get a large percentage of armature repairs done by private firms whenever possible. Unfortunately, the delivery of armatures from these firms has been uncertain, and at the present time a large number of cars are still disabled on this account. Forty-four armatures are at present away at five different firms for re-winding, and every effort is being made to get this work completed quickly.

Gears and Gear Cases.—A large number of cars are now running without gear cases, as we have not been able to get delivery of these during the period of the war, and, as the wear on gears and pinions without lubrication is very rapid, the number of cars coming in for gear wheel renewals is increasing daily.

Life-guards.—The increased number of life-guard breakages is due solely to the bad condition of the track, and the necessary repairs to these have been delayed by the non-delivery of materials. After a heavy snowstorm many life-guards are always broken, and under present conditions there are no spare cars available to maintain the required service.

Trolleys.—The abnormal number of trolley troubles is chiefly due to the bad track, faulty driving, high speeds over bad track through frogs, crossings, and round curves.

Controllers.—The conditions obtaining with regard to these are inefficiency in operation and repair.

Hand Brakes.—The general condition of the brake gear is due to failure of supplies of bolts, nuts, pins, etc.

Track Brakes.—These have suffered severly owing to the bad condition of the track. In many cases the repairs to the damaged gear necessitates the car being in the repair shop for two or three days.

Accidents.—Damages to cars by collision in 1918 have increased to the alarming extent of 370 per cent. over the corresponding period of 1914, due to inexperienced drivers.

Power and Light Cables.—The frequent breakdown of light and power cables is chiefly due to the fact that most of the cars require re-wiring throughout, as with their length of service the insulation has perished, with the result that in the particularly inclement weather which is experienced at this season of the year breakdowns are unavoidable. The present position with regard to staff and materials renders re-wiring impossible.

Destination Indicators.—These have suffered severely by the rough treatment of the conductors, lids being left off, thus allowing the linen, wiring, lamp holders, etc., to become saturated with water, with the result that we have been unable to cope with the necessary repairs.

Railless Cars.—It has been impossible to maintain a regular service of these cars at Guiseley owing to not being able to get materials for repairs, viz., armatures, worm gear cases, rear road wheels, etc.

It is gratifying to find that very considerable numbers of the men who were in the service in 1914 and have since been on active service are now returning and taking up their duties again. They will undoubtedly give stability and regularity to the service, and already an improvement is recognisable. In the meantime every effort is being made to get more cars on the road, and it is hoped within a short period that 30 additional cars will be available for daily service, but it will be many months before the system can be built up to the high standard of maintenance and comfort which in the past were its distinguishing features

COMPARISON OF REPAIRS.—LEEDS CITY TRAMWAYS.

January 1914 and January 1919.

Total number of defective cars run into depot, January 1 to 31 inclusive, 1914—331.

Total number of defective cars run into depot, January 1 to 31 inclusive, 1919—768.

The chief defects coming under the following headings :—

	1914. 31 days.	1919. 31 days.		1914. 31 days.	1919. 31 days.
Life-guards	8	138	Cables—Power	14	17
Trolleys	16	69	Light	4	25
Collisions	3	17	Handrails alive	3	6
Brakes—Hand	14	78	Hot axles	11	17
Electric	4	3	Broken axles	5	2
Track	16	64	Tires	3	9
Motors	170	199	Broken windows	12	7
Controllers	21	70	Miscellaneous	23	33
Resistances	4	14			
			Total	331	768

The total number of armature repairs for the year 1914 was 728, of which 67 had to be re-wound.

The total number of armature repairs for the year 1918 was 772, of which 217 had to be re-wound ; 85 by outside contract.

Total number of defective cars run into depot during seven days, weather normal = 70 ; immediately after snowstorm = 164

Total number of cars run into depot for defective life-guards during seven days, weather normal = 13 ; immediately after snowstorm = 53.

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THE LONDON COUNTY COUNCIL TRAMWAYS.

Annual Accounts, 1917–18.

The Highways Committee at the meeting of the Council on April 1 submitted the following statement on the annual accounts for the year 1917–18:—

The accounts of income and expenditure for the year ended March 31, 1918, have now been made up, and the Highways Committee submit the accounts as prepared by the comptroller of the Council, together with a memorandum by the general manager on the working of the undertaking.

The tramways system on March 31, 1918, extended over a total length of 149 street miles, being 144½ miles of electric lines (122 conduit and 22½ overhead), and 4·6 miles of horse lines. The whole of the system is worked by the Council, with the exception of 2¼ miles (partly double and partly single line) in Harrow Road, which is worked by the Metropolitan Electric Tramways, Limited, on the overhead system of electric traction. The undertaking comprises the lines transferred to the Council from various tramway companies, together with new lines constructed by the Council.

The only horse tramway routes not yet electrified are those in Burdett Road and Grove Road, etc., and in Southwark Park Road, etc., and as the services on these tramways have been withdrawn the system in operation by the Council consists entirely of electric tramways, the length being 141·67 street miles.

Results of Working.

The total income from the undertaking during the year and the working expenses were as follows:—

Year ended March 31.	1918.	1917.	1916.	1915.	1914.
	£	£	£	£	£
Income	2,932,140	2,552,203	2,339,291	2,399,487	2,268,669
Working expenses* ...	2,128,686	1,817,694	1,683,660	1,700,212	1,615,467
Surplus on working ...	803,454	734,509	655,631	699,275	653,202
Deductions —					
Debt charges —					
Interest ...	293,568	314,164	326,477	330,300	—
Redemption ...	428,320	429,851	425,908	405,605	—
	721,888	744,015	752,385	735,905	736,602
Rent drawbacks, etc.	—	7,551	6,797	—	—
Income-tax	75,412	73,000	40,000	32,102	28,197
Parliamentary expenses	—	18	2,260	2,803	2,082
Amount due to Metropolitan Electric Tramways, Ltd., under through-running agreements	—	1,528	—	—	—
Other charges ...	249	—	—	—	—
	797,549	826,112	801,442	770,811	766,881
Less tax deducted, interest on cash balances, rents, etc. ...	89,654	102,945	72,061	38,363	25,153
Total deductions from surplus	707,895	723,167	729,426	732,448	741,728
Balance	95,559 (Surplus)	11,342 (Surplus)	73,795 (Deficiency)	33,173 (Deficiency)	88,526 (Deficiency)

* Includes war service allowances, 1917-18, £119,432; 1916-17, £110,155; 1915-16, £95,365; 1914-15, £42,209.

The total number of passengers carried during the year was 593,516,141; the number of car miles run was 49,189,866. The corresponding figures for 1916–17 were 586,127,976 and 49,478,973.

The operating expenses were £2,002,200 (excluding war service allowances of £119,432 4s. 7d., and certain special charges amounting to £7,053 1s. 5d.).

In the following table particulars are submitted, as regards electric tramways worked by the Council, of the average track miles open, receipts per mile of track, the total number of passengers carried, and the gross passenger receipts for the 12 years ended March 31 1918:—

Year ended March 31.	Average electric track miles open.	Average passenger receipts per track mile.	Total number of passengers carried on electric lines.	Gross passenger traffic receipts.
		£		£
1907	40·66	19,929	183,062,063	810,320
1908	61·91	20,223	279,166,461	1,252,001
1909	77·94	19,752	344,705,937	1,539,434
1910	99·61	18,546	418,317,377	1,847,327
1911	116·98	17,925	482,296,935	2,096,914
1912	127·55	17,498	516,092,489	2,231,902
1913	132·49	16,179	501,102,149	2,143,559
1914	136·62	15,967	516,338,859	2,181,344
1915	140·66	16,516	547,253,332	2,323,130
1916	141·52	16,097	545,247,747	2,278,115
1917	141·67	17,479	586,127,976	2,476,309
1918	141·67	20,206	593,516,141	2,862,554

Capital Expenditure and Repayment.

The capital expenditure on the undertaking up to March 31, 1918, amounted to £13,659,588 19s. 4d., of which £89,469 17s. 5d. represents expenditure during the year 1917–18.

The amount of the debt incurred up to March 31, 1918, was £13,988,671 19s. 4d. The net debt on March 31, 1918, i.e., the debt outstanding, after allowing for debt repaid out of revenue and sinking fund balances, and for £120,216 in respect of the value of surplus land, was £8,764,004 8s.

The sums paid by the Council out of the revenues of the tramways undertaking during the past six years for the redemption of debt have been as follows:—

1912–13, £388,042	...	...	1915–16, £425,908
1913–14, £408,488	...	...	1916–17, £429,851
1914–15, £405,605	...	...	1917–18, £428,320

The total amount of debt repaid out of revenue up to March 31, 1918, was £4,613,919, to which must be added an amount of £401,870 from proceeds of sales, making in all £5,015,789.

The amount of capital expenditure, which up to March 31, 1918, had become obsolete owing to the electrification of horse tramways, was £2,024,687 15s. 3d. The debt in respect of this expenditure has been reduced to £914,896 2s. 9d. Certain other expenditure amounting to £117,829 15s. 4d., incurred in connection with electric traction, has also been rendered obsolete. The repayment of this is being provided for over short terms specially approved by H.M. Treasury.

Renewals Fund and General Reserve Fund.

The renewals fund amounted on March 31, 1818, to £324,451 5s. 11d. Up to the year 1911–12 full provision for this fund was made out of the revenues of the undertaking on the basis approved on June 23, 1908, of two-thirds of a penny for each car-mile run, but the financial results of the working of the past six years have not enabled provision to be made on this basis. During this period the available surpluses have been paid into the fund, including in 1917–18 the surplus of £95,559 3s. 10d. The consideration of the basis of the provision has been postponed from time to time.

The general reserve fund on March 31, 1918, amounted to £74,667 4s. 6d. In the case of both the renewals fund and the general reserve fund the balances stated take no account of the depreciation of investments.

War Service Allowances, War Wages, and War Bonus.

The total of the war service allowances granted by the Council and charged to the tramway's account during 1917–18 in respect of men serving with the forces of the Crown amounted to £119,432. From the outbreak of war until March 31, 1918, the tramway's account has been charged with a total amount of £367,162 for war service allowances.

The cost of the war wages and war bonus to employees during 1917–18 was £321,125, the total sum paid in this respect since the commencement of the war to March 31, 1918, being £497,013.

Rates, Maintenance of Paving, and Street Widenings.

The total sum paid to Metropolitan Borough Councils as rates on the permanent way amounted in 1917–18 to £65,179 15s. 9d., and represents an average relief to the rates of London of about $\frac{3}{10}$d. in the £. This amount of £65,179 15s. 9d. is in addition to rates and taxes paid by the Council in respect of tramway offices, car sheds, sub-stations, depots, etc.

The saving to the road authorities in consequence of the obligation of the Council to maintain the paving along the tramway routes is estimated by the Council's officers at about £184,000 a year on the present mileage; this estimate being based, of course, on the normal standard of maintenance.

The aggregate amount chargeable to the tramways account in respect of the cost of effecting street improvements carried out along tramway routes, under resolutions already passed by the Council, is approximately £800,000, of which £736,951 had already been so charged up to March 31, 1918. The amount estimated to have been paid to tramway companies (as part of the purchase money for their undertakings) in respect of the expenditure incurred by them on street improvements is £40,576, the whole of this amount being charged to the tramways account.

The amount actually charged to the tramway's revenue account during the year 1917–18 in respect of rates on tracks (£65,180) and debt charges on street improvements (£36,040), together with the estimated saving to local authorities on maintenance of paving (£184,000), gives a total of £285,220, and various rates were therefore relieved to this extent.

Fares—A Canadian View.—The Niagara Falls *Review* very naively remarks:—"There may be some truth in the statement that our local street railway line is not a money maker; but when taken over by the city the rate can be increased if necessary." And yet, remarks the Canadian *Electrical News*, if the private owners asked for an increase in order to improve the service it would doubtless be called "impudence," following the precedent established by the Mayor of Toronto.

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FINANCIAL REPORTS AND MEETINGS.

SOUTHAMPTON CORPORATION TRAMWAYS will contribute £8,000 to the relief of rates for 1919-20.

HONG KONG TRAMWAYS COMPANY have declared a further dividend of 10d. per share, making 28½ per cent. for the year, against 23 per cent. last year.

MANILA ELECTRIC RAILROAD AND LIGHTING CORPORATION.—A dividend has been declared of 1½ per cent. (1·50) per share for the quarter ended March 31.

THE MIRRLEES WATSON COMPANY have declared a dividend of 10 per cent. and a bonus of 2½ per cent., both less tax, for the past year. The rate was the same a year ago.

DUBLIN AND BLESSINGTON STEAM TRAMWAY COMPANY.—A dividend of 5 per cent. for the year ended December 31, 1918, has been declared on the baronial guaranteed shares.

EAST HAM TRAMWAYS DEFICIT.—It is estimated that the deficit on the East Ham Corporation Tramways for the year ended March 31 will be equivalent to a rate of 6¼d. in the £, as the deficit will amount to £13,980. The estimated deficit on the electricity undertaking is £8,860

PAISLEY DISTRICT TRAMWAYS COMPANY.—A dividend is announced at the rate of 5 per cent. per annum (5s. per share) on the preference shares for the half year, making 5 per cent. for the year. A sum of £16,000 is added to the general reserve, making £100,211, £5,000 to income-tax reserve, and £6,072 is carried forward.

BRITISH INSULATED AND HELSBY CABLES, LIMITED.—A dividend at the rate of 8¾ per cent. has been declared for the half year, making 12½ per cent. for the year on their revised capital. A sum of £80,000 is carried to reserve and depreciation, and £99,000 is carried forward. Last year the dividend was 7½ per cent. with a bonus of 10 per cent., making 25 per cent. for the year on the old capital.

CITY OF OXFORD ELECTRIC TRAMWAYS.—The directors recommend a dividend at 4 per cent. for the year 1918. The gross profit amounted to £10,454. After deducting debenture interest and amount transferred to sinking fund for redemption of debentures, etc., there is a balance of £6,234, or, including £2,035 brought forward, £8,269. Five thousand pounds has been allocated to depreciation on motor omnibuses and chars-a-banc, and after the payment of dividend, £685 is carried forward.

HULL CORPORATION TRAMWAYS.—The chairman reported at the last meeting of the Tramways Committee that the rough balance sheet for the financial year showed a total revenue of £234,770, and an expenditure of £224,757, leaving a balance of £10,018. He considered that very satisfactory considering the enormous expenditure. They were paying £40,000 a year more in wages than before the war. The total capital invested is £600,000, and on this the profit was £10,000. For the last five years they had lost £50,000 in halfpenny fares.

WEMYSS AND DISTRICT TRAMWAYS COMPANY, LIMITED.—The report for the year ended December 31, 1918, shows that the profit amounted to £7,530, and with £828 brought forward there is an available balance of £8,558. After paying interest on mortgage debenture stock, £1,583, and placing £200 to the fund for the redemption of stock, a dividend at the rate of 6 per cent. on the preference shares and a final dividend at the rate of 6 per cent. on the ordinary shares is recommended. Three thousand pounds is transferred to general reserve, and £1,045 carried forward. The traffic receipts for the year amounted to £22,021.

KILMARNOCK ELECTRIC TRAMWAYS.—The accounts of Kilmarnock Corporation Tramways Department show a total gross income of £11,144, against an expenditure of £10,004. When loan charges, interest, sinking fund, and other requirements, amounting to £3,605, have been deducted, there remains a deficit of £3,355 to be met by assessment. The average fare charge per mile is 0·86d., and the average earnings per car-mile is 10·77d. The car-miles run during the twelve months totalled 245,828; number of power units used, 362,769; the number of passengers carried being 2,990,530. Operating expenses per car-mile, excluding power cost, were 7·922d., including power cost, 9·767d.

PARA ELECTRIC RAILWAYS AND LIGHTING COMPANY.—Presiding at the annual meeting, Mr. Follett Holt said that the earnings for the year had been adversely affected by the economic depression and the disturbances of the last year of the war, while a violent epidemic of influenza had paralysed the public services. Operating expenses had further increased, owing to trade restrictions and higher wages. As a result the balance carried to profit and loss, after allowing for exchange differences, had decreased by £8,782, or about 7 per cent. The directors, however, felt no anxiety at the decrease, and it did not indicate a standstill in the development of the business. With their liberal allocation to renewals and reserve, it was a satisfaction to the board to recommend the maintenance of a dividend of 7 per cent.

UNDERGROUND ELECTRIC RAILWAYS COMPANY.—Lord George Hamilton, presiding at the annual meeting of the Underground Electric Railways Company of London, Limited, described the report as the best in the history of the company. Referring to the question of the suggested increase in fares, he said that sometimes the raising of fares operated in such a manner as to reduce the revenue. Alterations under the present conditions would require very grave consideration. The shorter working day now becoming general would add heavily to their working costs, and further fare adjustments were now being made to meet them. The Associated Equipment Company had had a good year. During the war its business had so expanded that it was not likely to be wholly occupied in manufacturing for the Omnibus Company. Its future must depend largely upon the commercial development of the heavy petrol-driven vehicle. There was probably no enterprise more captivated by the idea of nationalisation than the Underground. Their railways were protected by statutory powers, but their omnibuses were open to competition and attack. The omnibuses carried nearly two-thirds of the passengers, and if there was any very heavy curtailment of traffic by outside competition, the dividends of the Underground would be greatly diminished.

READING TRAMWAYS.—Mr. G. F. Craven, general manager and engineer of Reading Corporation Tramways, in a report to the Tramways Committee, says that the receipts for the years 1905 to 1912 varied between £32,543 and £34,277, but from 1913 a very rapid increase took place, which promises this year to bring the receipts to £68,000. It is impossible to estimate even approximately the revenue for the next year, because it will largely depend on a decision in regard to fares and the prosperity of the borough. While variations in wages were slight up to 1915, since then the increase has been marked, and in the present year may reach £35,000. Wages on all tramways must increase with the introduction of a shorter week. Next year more men will have to be employed in repairs to permanent way, rolling stock, and buildings. Taken altogether, the estimated wage increase of £42,000 for 1920 cannot be regarded as too high. The prices of the principal materials have increased from 200 to 300 per cent. since 1914, and quotations by manufacturers of tramway supplies continue to increase. The manager considers that the estimated cost of materials at £20,000 is quite moderate and not easily to be reduced if the tramway equipment is to be maintained in good order. After adding to the foregoing figures capital charges of £11,732, there is a total charge against revenue of £73,730. The estimated financial result for the year ending March 31, 1920, is not very reassuring, for it shows that the expenditure may exceed the total revenue by £5,730, and points to the fact that every reasonable effort must be made to increase the revenue.

BRISTOL TRAMWAYS AND CARRIAGE COMPANY.

For the year ended December 31, 1918, the revenue amounted to £749,873, and the working and general expenses and renewals to £634,775, leaving with the amount brought forward an available balance of £133,249, or an increase of £11,007. Interest on investments has been carried to the reserve fund, and after adjusting the securities to their value at December 31 last, this fund stood at £381,413. With the addition of £40,000 now proposed, and £25,000 to provide for deferred repairs, renewals, and exceptional wear and tear of plant and equipment, the total reserves will amount to £471,413. Receipts of the tramways show a decrease of £467, and of the carriage department an increase of £105,670. Passengers decreased by 2,168,651, to 61,813,124. The annual dividend rate is to be 7 per cent., the balance payment of 4 per cent., being free of income-tax, and £40,000 is once more to be reserved for contingencies and renewals. The total reserves will stand at £471,413. The option of the Bristol Corporation to purchase the undertaking was extended during the year by a further order from the Board of Trade to October 31, 1919.

A comparison of the results for the past five years is appended :—

	1918.	1917.	1916.	1915.	1914.
	£	£	£	£	£
RECEIPTS —					
Tramways department ...	284,866	285,333	254,597	248,355	239,651
Carriage department	452,738	347,069	294,081	258,530	209,512
Sundry receipts	12,269	10,381	7,229	5,500	5,611
	749,873	642,783	555,907	512,385	454,774
EXPENSES —					
Traffic expenses	295,531	236,884	187,567	175,415	174,623
General expenses	99,221	79,488	88,472	75,916	58,947
Renewals, repairs, and maintenance	240,024	213,804	174,408	162,189	138,615
	634,776	530,176	450,447	413,520	372,185
Net revenue	115,097	112,607	105,460	98,865	82,589
Balance from last account ...	18,152	9,636	5,056	—	—
Total	133,249	122,243	110,516	98,865	82,589
Interest	22,666	25,696	27,598	30,502	30,638
Interest carried to reserve fund	6,633	5,270	4,563	4,365	4,468
Dividend on 4 per cent. pref. shares	14,250	15,000	15,542	17,333	18,458
Interim dividend (June) on ordinary shares	15,000 (3 p.c.)	9,375 (5 p.c.)	10,052 (5 p.c.)	8,984 (4 p.c.)	9,396 (4 p.c.)
Final dividend for half-year on ordinary shares	20,000	18,750	13,125	12,625	11,328
Dividend rate for year	7 p.c.	6¼ p.c.	6 p.c.	5 p.c.	4½ p.c.
Addition to reserve fund	40,000	30,000	30,000	20,000	8,301
Carried forward	14,700	18,152	9,636	5,056	—

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LIVERPOOL CORPORATION TRAMWAY YEAR.

Manager's Comment on War Difficulties.

In introducing his report for the year 1918, Mr. Mallins, general manager of Liverpool tramways, says that he fully appreciates the great inconvenience caused to the travelling public owing to the depleted service, brought about by the large number of tramway employees who have joined H.M. Forces, and in addition the difficulty of obtaining material and new rolling stock. The enormous increase in the traffic as compared with pre-war times has also been a factor over which the committee and management had no control. Out of a total staff of under 3,000, no fewer than 2,300 left the tramway service to join the forces. Among these were many skilled mechanics who were engaged in the maintenance of the rolling stock. The difficulty of dealing with the traffic is obvious when it is stated that the number of passengers in 1918 amounted to nearly 200,000,000, as compared with 130,000,000 in pre-war times. The public have borne the inconvenience with admirable fortitude, recognising the difficulties which had to be met. On the signing of the armistice the committee lost no time in taking action for the provision of an improved service. It has been decided to purchase 100 new motor omnibuses, as it was found that these vehicles could be obtained and placed in service much earlier than tramway cars. The omnibuses will not be run in competition with the tramway service, but will form a most desirable adjunct. Each of the systems has its sphere of usefulness if judiciously handled, and it is Mr. Mallins' opinion that the motor omnibus will in the future play an important part in obviating the present traffic congestion in large cities and towns. To augment the tramway service 100 additional tramway cars are being provided and new electrical equipment is being purchased to put the whole of the rolling stock in an efficient state of repair. Up to the time of the armistice the Lambeth Road car works were largely occupied in the manufacture of shells and aeroplanes.

Mr. C. W. Mallins further frankly expresses his opinion of the methods adopted by the Government in connection with the supplies of material and the substitution of labour, which to say the least, he remarks, appear a little strange to the ordinary business man. There have been numerous Government Committees formed, and legions of officials appointed, whose principal occupation was apparently to send out a large number of forms with peremptory orders to tramway managers to have them filled up and returned. These forms had to be filled up by depleted tramway staffs, who in many cases could ill afford the time to perform this work. It is the opinion of many that the utility of these forms would not justify the time and stationery expended upon them, especially having regard to the fact that the result, so far as assisting tramway undertakings in obtaining supplies of material and labour was concerned, has been generally of a negative character.

Financial Results.

The results for the year ended December 31, 1918, compared with those of the four preceding years, are as follow :—

	1918.	1917.	1916.	1915.	1914.
	£	£	£	£	£
Capital expenditure ..	2,068,395	2,068,430	2,068,453	2,068,453	2,062,391
Loan outstanding ..	950,988	998,244	1,008,694	1,212,713	1,168,685
Traffic revenue ...	962,538	818,756	738,321	696,893	684,026
Total revenue	989,504	845,645	766,577	726,078	722,307
Working expenses ..	716,479	575,267	518,037	488,274	473,678
Gross balance	273,025	270,378	248,540	237,804	248,629
Net profit	169,322	167,243	145,971	123,193	134,821
Average fare per passenger	1·184d.	1·137d.	1·124d.	1·109d.	1·127d.
Traffic receipts per track-mile	£7,762	£6,602	£5,954	£5,620	£5,516
Traffic receipts per car-mile	18·91d.	15·56d.	13·97d.	13·20d.	12·02d.
Power cost per car-mile	2·740d.	2·584d.	2·490d.	2·348d.	2·171d.
Operating costs per car-mile	14·082d.	10·880d.	9·798d.	9·240d.	8·323d.
Total charges per car-mile	16·120d.	12·890d.	11·738d.	11·409d.	10·322d.
Ratio of expenses to revenue	72·40%	68·02%	67·5%	67·2%	65·6%
Total track mileage ...	124	124	124	124	122
Number of cars in stock	—	598	598	599	596
Car mileage	12,210,763	12,630,577	12,688,163	12,682,018	13,657,888
Passengers carried ...	195,082,609	172,842,494	157,636,595	150,755,680	145,656,374

Need for Increased Fares in New York.—Mr. Theo. P. Shonts, president of the Interboro Rapid Transit Company, which operates the subway and elevated railways in the boroughs of Manhattan and the Bronx, New York City, states in a letter to the City Council that unless an eight-cent fare is granted the company faces bankruptcy. The present fare is five cents (2½d.) for any distance, and the company now finds its expenses so high that there is a loss on every passenger. It consequently desires to increase the uniform fare to 4d.

PERSONAL.

Councillor James Cavey has been appointed chairman of Wigan Corporation Tramways Committee.

Mr. E. H. Bond, general manager of Dover Corporation Tramways, has been granted a war bonus of £25.

Mr. Peter Fisher, general manager, Dundee Corporation Tramways, has received an increase of salary to £700.

Mr. C. D. Braidwood, of Leeds Corporation Tramways department, has been appointed superintendent of the Metropolitan Electric Tramways.

Mr. H. F. Street, who has been borough electrical engineer of Southampton for the past 18 years, has, owing to eye trouble, tendered his resignation.

Sir Maurice Fitzmaurice, C.M.G., has resigned the chairmanship of the Canal Control Committee, and **Mr. Sidney Preston** has been appointed as his successor.

Mr. C. D. Flint, for many years advertising manager of the Edison-Swan Electric Company, has started business as an advertising agent at 190, Fleet Street, E.C.

Mr. Benjamin Hall, of Keighley, has been appointed rolling stock superintendent, works manager, and engineer of Wigan Corporation Tramways at a commencing salary of £250, rising to £300.

Mr. William Billington, assistant to the general manager of Salford Corporation Tramways, has been appointed general manager of Wigan Corporation Tramways at a commencing salary of £450, rising by two annual increments to £500.

Mr. S. L. Pearce, chief engineer and manager of Manchester Corporation electricity department, has been granted an increase in salary from £1,500 to £2,000 per annum. **Mr. W. E. Foden,** financial superintendent, has been granted an increase from £500 to £600 per annum.

Mr. T. Metcalf, who has been manager of the Swindon Corporation Tramways, has been appointed general manager by the Tramways and Electricity Committee, and **Mr. F. Newey,** who has hitherto been acting electrical engineer, has been appointed electrical and mechanical engineer.

Captain C. Burgess, R.E., general manager of the West Hartlepool Corporation Tramways, has resumed his duties. Captain Burgess has been absent on service since 1915, and has been two and a half years in Mesopotamia.

Mr. P. F. Sullivan, at a meeting of the Institution of Civil Engineers of Ireland on March 3, read a paper on "Tramway Curves and Special Work." The paper was accompanied with plates of various forms of curves, which were dealt with from a mathematical point of view.

The King of the Belgians has been graciously pleased to create **Mr. Philip Dawson,** M.Inst.C.E., M.I.Mech.E., M.I.E.E., "Chevalier de l'Ordre de Leopold," in recognition of his services as a member of the Belgian Royal Commission on the electrification of the Belgian State Railways.

Mr. G. G. L. Preece, Lieutenant, Lancashire Fusiliers, T.F., and R.E., has been demobilised and has returned to his old post as branch manager of the Manchester district for Messrs. Bruce, Peebles and Company, Limited, Edinburgh. His address as before is 30, Cross Street, Manchester.

Mr. Charles E. Inglis, University lecturer in mechanical engineering, has been elected to the professorship in mechanism and applied mechanics at the University of Cambridge, in succession to the late Professor Bertram Hopkinson. The stipend is £850 per annum, with £450 from the receipts of the department.

Mr. Robert M'Creary, who is at present serving as a major in the Royal Engineers, has been appointed assistant permanent way engineer on the Belfast Corporation Tramways. Major M'Creary is a native of Belfast, and was educated at the Royal Academic Institute, taking his degree at Queen's University.

Mr. E. W. Cockerlyne has been appointed highways and tramways permanent way engineer of Leeds Corporation, in succession to Mr. R. B. Holt, who, as mentioned in a recent issue, has resigned that position in order to accept an appointment on the staff of Messrs. Sandberg, consulting engineers, of Westminster.

Mr. J. H. Shaw, deputy electrical engineer of Bradford Corporation, has resigned his appointment, and will become the representative of the Davenport Engineering Company, Messrs. Hick, Hargreaves and Company, and J. Shaw, Son and Greenhalgh, with offices at Temple Chambers, Temple Avenue, London, E.C.

Mr. W. Clough, who recently resigned the general managership of Bury Corporation Tramways department, in order to accept an important position in the paper manufacturing industry, has been presented by the chief officials with a silver tea set as a mark of their appreciation of his services to the Corporation for twenty-six years

The salary of **Mr. Arthur Ellis** as tramways engineer and manager of Cardiff Corporation Tramways has been increased from £500 to £750 a year. As chief engineer and manager of the electricity

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department, Mr. Ellis receives in addition a salary of £500. The salary of **Mr. C. G. M. New,** deputy manager of the tramways, has been increased to £525 per annum.

Mr. E. Sidgwick, who was recently appointed superintendent of Southport Corporation Tramways, has been presented with a solid silver fruit dish and a pair of silver vases from the employees at Rochdale, where he has previously been rolling stock superintendent. Mr. George Webster, general manager, spoke highly of Mr. Sidgwick's services during the past 11 years, and Mr. A. Marsden made the presentation.

Mr. T. Inglis Rudman has taken up his duties as tramway permanent way engineer for Sunderland Corporation at a salary of £300 per annum. There were 17 applicants for the post. Mr. Rudman served his articles in the Midland Railway civil engineering department at Derby, and afterwards was resident engineer at Aberdare, Norwich, and on the Tyneside, and has since been surveyor in the works department of the Ministry of Munitions at Bristol. He has had much foreign experience in Costa Rica, the Argentine, Chili, Peru, and Panama. Just before going to Sunderland, Mr. Rudman was with Messrs. Clegg and Sons, a Manchester firm of engineers.

The death of **Mr. T. P. Tierney,** after an attack of influenza, has taken place at Monkstown, co. Dublin. Mr. Tierney was formerly connected with the Dublin United Tramways Company, and was well known in Ireland as a consulting engineer.

We regret to record the death of **Mr. W. H. S. Dawson,** city engineer of Bradford, which took place on Saturday last at the age of 58. Mr. Dawson was responsible for the construction and maintenance of the permanent way of the tramways.

TRAMWAY AND LIGHT RAILWAY NOTES.

BELFAST.

INFLUENZA AMONG CAR EMPLOYEES.

Mr. J. S. D. Moffat, general manager of the Corporation tramways, recently reported to the Tramways Committee that they were severely handicapped owing to the large number of motormen and conductors laid up with influenza. The maximum number away at one time was 92, that number later being reduced to 62.

BIRMINGHAM.

SIX MONTHS FOR DELIVERY OF NEW CARS.

At a meeting of the Tramways Committee it was announced that an order had been placed for fifty new cars. The total number of cars in service is now 586, and several of the new cars will be replacements. The chairman, Councillor Lee, stated that considerable difficulty had been experienced in obtaining rolling stock, and it would be more than six months before any of the new cars could be delivered. Attention is being given to track renewals, but the dearth of material prevented much progress. There was, however, a prospect now of the release of more.

BRISTOL.

COAL ALLOWANCE HANDICAP—IMPROVED OMNIBUS SERVICES.

Tramway services cannot be run on Sunday in Bristol until there is an extension of the coal allowance. Several of the suspended motor omnibus services have been restored, though as a whole the service has not yet reached the pre-war standard; but other services will be resumed as circumstances allow. The company propose to meet all demands for pleasure trips in the summer as far as they are able, but shortage of labour and materials is a serious handicap.

CARDIFF.

TRAMWAY ADVERTISING TO BE CONTINUED.

At a meeting of Cardiff City Council, Councillor A. J. Howell moved the rescinding of the resolution of the Electric Lighting and Tramway Committee that on the expiration of the existing agreement the advertising on the outside of tramway cars be discontinued. He urged that with the city rates going up it was not reasonable to sacrifice the revenue to be derived from advertisements. The motion was seconded by Councillor T. Morgan, and carried by 14 votes to 11.

DUNDEE.

ELECTRIC WELDING PLANT FOR RAILS.

The tramways department have purchased an electric welding plant, and representatives from several tramways recently witnessed experiments with it. The plant, which was supplied by the Equipment and Engineering Company, of 2 and 3, Norfolk Street, London, W.C., will be used for rail repair and rail welding, and it is expected to reduce the cost by about one quarter. The plant will also be of great service, of course, in repair work in the car sheds.

EDINBURGH.

DEFINITE STEP TOWARDS ELECTRIFICATION—ADMINISTRATIVE TRAMWAY STAFF—PASSES FOR COUNCILLORS—TOP COVERS FOR CARS.

The sub-committee of the Town Council, to whom was remitted the report of the general manager (Mr. R. S. Pilcher) on the future arrangements for the construction and development of the tramways, have recommended that the cable system be abolished as soon as practicable after the tramways are taken over by the Corporation at the end of June next, and that the overhead trolley system be introduced generally, leaving special parts of the city to be considered separately. The sub-committee recommend that plans should be prepared at once, and that the first route to be dealt with should be that from Pilrig to Liberton. The sub-committee further recommend that the Corporation should acquire a number of motor omnibuses with a view to running them both within and without the city boundaries as supplementary to the tramways. The deputation from the Tramways Committee that visited London recently to inspect the working of the conduit system were favourably impressed with the facility with which the cars pass from the conduit to the overhead sections. They consequently think that the installation of the conduit system on Princes Street should be carefully considered. Mr. R. S. Pilcher, the tramways manager, has been instructed to make arrangements for organising an administrative staff. Fifty additional top covers for cars are to be provided for use next winter. By a majority of 20 to 18 the Corporation have adopted a recommendation that free tramway passes should be granted to each member. It was originally proposed that councillors should pay £3 3s. per annum for season tickets.

GLASGOW.

ALL-NIGHT SERVICE OF CARS—THE 48-HOUR WEEK—PARCEL SERVICE DISCONTINUED.

Glasgow Corporation Tramways Committee have practically decided to run an all-night service of cars as soon as the labour and materials necessary for increasing the number of available cars can be obtained. In the Corporation tramway department the 48-hour week was put in operation at the works and depots early in March, and this month it is in force among the traffic staff. The change entails a large addition in the number of employees, and, of course, to the working expenses. It has been decided to discontinue the special car service in Glasgow for the conveyance of parcels from the centre of the city to Uddingston. The experiment was made for three months at the request of the Road Transport Board, who suggested that the carriage of parcels by tramway cars to various parts of the city would remove the congestion of railway and motor traffic in these districts. The service has, however, been little used, and the experiment confirms the view expressed by the local tramway officials when the suggestion was first made.

NOTTINGHAM.

CAR EQUIPMENTS THREE YEARS ON ORDER—EXTENSIONS POSTPONED—WAGES COST AND HIGHER FARES.

Nottingham Corporation Tramways Committee have placed orders for twenty-five new cars at a total estimated cost of about £40,000, and similar in type to the Nottingham Corporation standard car which was illustrated in our issue of September 12, 1918. Three years ago the committee provisionally ordered a number of new equipments and car bodies to replace those which are worn out, and they hope to obtain delivery of these at an early date. At the present time seventeen cars are permanently disabled awaiting the installation of new equipments, and many others require extensive repairs. The Corporation are seeking an extension of time for another twelve months, to August 15, 1920, in which to extend the tramway lines to Beeston. The high price of materials and labour renders the scheme impracticable at the present time, but the Corporation still hope to carry out the work. Mr. R. H. Swain, chairman of the tramways committee, at a recent Council meeting, said that it was impossible for the penny fare to be again introduced. The minimum fare might have to be raised even above 1½d. if the 44-hour week were granted to the employees. The cost of this would be £30,000 a year, while the 48-hour week would cost £17,800 a year, or, including several other provisions under discussion, £25,000 a year. The cost of the 48-hour week already promised would amount to more than the whole of the working expenses of the department previous to the war.

PORTSMOUTH.

TWENTY-MILE RIDE FOR ALLIED SAILORS.

The Mayor of Portsmouth (Mr. J. Timpson) gave 150 Japanese and 50 British seamen a twenty-mile excursion by tramway car to Horndean and back on March 3. He subsequently entertained the party to tea at the Town Hall, and afterwards at the Hippodrome.

RHONDDA.

RESUMPTION OF THE RAILLESS SERVICE.

The running of the railless cars of the Rhondda Tramways Company between Penygraig and Gilfach Goch will be resumed at Easter. The service was suspended during the war on account of the depletion of the staff.

SUNDERLAND.

INCREASED CHARGE FOR POWER—INDUSTRIAL JOINT COUNCIL.

Sunderland Tramways Committee have agreed to pay an extra ¼d. per unit for current supplied by the Corporation electricity department, making the cost 1¾d. per unit. This will increase the yearly cost for power by about £1,200. The committee recently convened a special meeting to discuss the question of setting up an Industrial Council as provided in the constitution of the Industrial Joint Council for the tramway industry.

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YORKSHIRE (WEST RIDING).

PRESENT AND PRE-WAR COSTS OF TRAMWAY CONSTRUCTION.

At a meeting of Wakefield City Council, it was reported that a conference had taken place between a sub-committee and Mr. H. England, general manager of the Yorkshire (West Riding) Electric Tramways, upon the question of a possible scheme of tramway or motor omnibus communication to Alberthorpe and Flanshaw. Mr. England had pointed out that the cost of tramway construction at present would be prohibitive. Rails, for instance, which before the war cost £6 12s. per ton, now cost £17 10s. per ton, and only recently the Corporation of Sheffield had paid nearly £3,000 each for new tramway cars as against the pre-war cost of about £900. The cost of construction per single track mile was now estimated at from £8,000 to £10,000, as compared with £5,000 before the war. With regard to omnibuses, if the roads could be made suitable, the company would be prepared to run omnibuses at their own risk.

CONTRACTS AND ORDERS.

T. Bolton and Sons are supplying five miles of copper trolley wire to Bradford Corporation, at £571 11s.

Salford Tramways Committee have ordered 72 lifeguard cradles from Mr. Joseph Bowring, of Manchester, at £144.

The British Westinghouse Electric and Manufacturing Company are supplying gear cases to Salford Corporation Tramways.

W. T. Glover and Company, Limited, have an order from Salford Electricity Committee for 700 yards of cable at £497 3s. 2d.

Birmingham Corporation have placed an order with the Brush Electrical and Engineering Company for 50 tramway cars.

Edgar Allen and Company, Limited, have an order for points and crossings from Southend-on-Sea Tramways, at a cost of £665.

British Insulated and Helsby Cables, Limited, have received an order for rail bonds from Bradford Corporation Tramways Committee.

Walter Scott, Limited, Leeds, are supplying 200 tons of tramway rails at £17 per ton, and three tons of fishplates at £21 12s. 6d. per ton, to Wolverhampton Corporation Tramways.

Southend Light Railways and Electric Lighting Committee have recommended the acceptance of a tender of the Niclausse Boiler Company, London, for a boiler, superheater, and accessories at £12,000.

The Woods-Gilbert Rail Remodelling Company, of 170, Strand, London, W.C., are about to begin the execution of a contract with the London United Tramways Company for the remodelling of the rails on certain sections.

The Rail Welding Company, of 119, Victoria Street, London, S.W., are the successful tenderers to Salford Corporation for welding and re-treading 400 joints by the company's electrical process. The value of the contract is approximately £1,000.

Bradford Tramways Committee have placed contracts with Dick, Kerr and Company, Limited, for 26 tramway cars with complete equipments, at £1,980 each, and for 52 traction motors, complete with controllers, resistances, and circuit breakers, at £246 each.

The Associated Equipment Company, Limited, has received an additional order for thirty single-deck omnibuses from Liverpool Corporation. Including the vehicles recently ordered by the Corporation from the same company, the new fleet now under construction consists of sixty single-deck omnibuses.

Dick, Kerr and Company, Limited.—A number of contracts for tramway material have recently been placed with Dick, Kerr and Company, Limited, which—under the recent consolidation scheme embracing this and other firms—will now be carried out by the English Electric Company, Limited. These contracts include orders for tramway cars complete with equipments and for car bodies, tramway motors, controllers, etc., from the corporations of Nottingham, West Hartlepool, Morecambe, Southport, Brighton, Huddersfield, Bradford, Liverpool, Manchester, Burton-on-Trent and others.

A LARGE TURBO-ALTERNATOR FOR GLASGOW.

The English Electric Company, Limited, in which are now consolidated the interests and activities of the Coventry Ordnance Works, Dick, Kerr, Phœnix Dynamo Manufacturing Company, United Electric Car Company, and Willans and Robinson, have recently secured an order for a second 18,750-KW. turbo-alternator set for the Glasgow Corporation, being a duplicate of the machine now in an advanced stage of manufacture. This contract includes, in addition to the turbo-alternator set, condensing plant and step-up transformers, and completes Mr. Lackie's first scheme of five sets for the Dalmarnock Power Stations.

The turbine will be a single unit machine of the firm's standard type arranged to run at 1,500 revolutions per minute, and will operate on steam at 250 lb. pressure, superheated to 650° F., and exhaust into a vacuum of 29·1 in. It will be coupled to a 6,500-volt 25-cycle 3-phase alternator, having a maximum continuous rating of 24,000 K.V.A. at 80 per cent. power factor.

The machine will be of the self-ventilating type, and will be electrically connected to a bank of three single-phase oil-circulated water-cooled transformers, stepping up the pressure from 6,500 to 20,000 volts An overhung exciter will be provided, as also air and oil cooling plant for alternator and transformers respectively. The condensing plant will be of the Willans surface type, with duplicate air extraction plants on the Willans rotary water jet system and extraction pumps in duplicate.

PATENT LIST.

Abstracted for "The Tramway and Railway World" from the Official Journal of Patents.

***** If the inventions have been communicated the names of the communicators are given in italics.**

APPLICATIONS FOR LETTERS PATENT.

The number of the patent is given in brackets.

Automobile signals (4,958)—C. B. Amos and W. E. F. Gibson.
Trolley wheels for electric traction (4,850)—G. H. Armitage, J. H. Rogers, and S. W. Shaw.
Variable speed gear (5,080)—Sir W. G. Armstrong, Whitworth and Company, C. B. Chicken, and G. Scott.
Changing gears of toothed variable speed gearing (5,022)—A. E. Bedford.
Variable gears for motor vehicles (5,034)—W. Blair and Rudge-Whitworth, Limited.
Steering wheels of motor vehicles (4,906)—W. A. Bowen and E. V. Pratt.
Sliding crown gear wheel for self-propelled vehicle (4,900)—J. Britton.
Change-speed gears for motor vehicles (4,780)—W. C. Butler.
Safety indicators for rear of motor cars (4,851)—C. L. Clarke.
Motor vehicles (4,735)—C. R. Compton.
Adjustment of cantilever springs of automobile chassis (4,731)—A. de Coninck.
Mudguard for motor vehicles (4,554)—H. J. Duffy.
Trailer wagons for motor vehicles (5,120)—J. Dyson.
Petrol tanks for motor vehicles (4,954)—A. H. Edson and R. Youster.
Change-speed mechanism (5,087)—A. Garelli.
Change-speed gears (4,560)—W. Hemingway and Hewlett and Blondeau.
Variable speed gear (4,679)—L. N. Hirst and T. E. C. Hirst.
Pumps for obtaining pressure in tanks of motor vehicles (4,766)—A. E. E. Jones and G. W. Pearce and Sons.
Trolley for electric tramways (4,955)—G. Odierno.
Change-speed gear of motor vehicles (4,595)—C. Stokes.
Brake gear of motor vehicles (4,596)—C. Stokes.
Transmission gear for motor vehicles (4,925)—J. T. Taylor.
Change-speed gears (4,685)—T. L. Williams.
Control mechanism for change-speed gears (4,686)—T. L. Williams.
Drive and rear suspension for motor vehicles (4,632)—L. W. Winter.
Gear boxes for motor cars (5,758)—G. Bradley and A. S. Graham.
Motor vehicles (5,651)—O. England.
Electrically operated engine starters (5,617)—F. J. Gill.
Variable speed gearing (5,489)—Sir H. Grubb and Sons, J. Rutledge, and J. Ryan.
Steel rail (5,599)—C. W. Knight and L. Knight.
Railway chairs (5,171)—A. S. McGruther.
Apparatus for signalling direction of travel and stopping on road vehicles (5,807)—M. R. Moore and H. L. Zeitun.
Tipping gear for motor vehicles (5,598)—J. J. Morgan and C. B. Rush.
Electrical machines for starting, lighting, and ignition of motor vehicles (5,625)—Powell and Hanmer, W. A. Shepherd, and F. E. Wilson.
Switch or cut-out for electric starters of motor vehicles (5,627)—Powell and Hanmer, W. A. Shepherd, and F. E. Wilson.
Electrically controlled brakes (5,382)—E. R. Smith.
Speed gears (5,989)—M. J. Adams.
Apparatus for lifting motors (6,526)—H. Baron.
Wheels and transmission gear of motor vehicles (6,033)—W. Beardmore and Co. and T. Broadbent.
Friction driving mechanism for vehicles (5,913)—F. C. Beauvais.
Route indicators (6,240)—W. R. Bridgens.
Apparatus for controlling and stopping vehicles (6,304)—British Thomson-Houston Company (*General Electric Company*).
Electric loom for motor vehicles (6,489)—H. J. Butterfield.
Transmission gear and bracket for magnetos of motor vehicles (6,001)—T. R. R. Chilcott.
Variable speed mechanism and clutch (6,442)—O. D. Clark.
Disc for controlling trolley wheels (6,025)—R. J. Clarke.
Tramway and railway rails (6,023)—J. Crimmins.
Motor vehicles (6,315)—L. W. Dewing and G. Page.
Railway crossings and points (6,005)—G. J. Fisher.
Variable speed transmission gears (6,363)—H. Grimshaw.

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Variable speed gear (6,468)—H. W. Horne.
Variable speed gear (6,298)—A. E. Hudd.
Transmission gearing (6,021)—C. A. Johansson.
Rail ties (6,173)—H. J. C. Jones.
Variable speed gears (5,901)—J. E. Kriegel.
Jacks for motor vehicles (6,141)—T. Maxwell.
Lighting or starting sets of automobiles (6,364)—P. C. Samuel and C. E. Skinner.
Sand-boxes for locomotives, etc. (5,990)—J. Southworth.
Rail fastening devices (5,890)—D. A. Tenge.
Apparatus for propulsion of vehicles (6,291)—E. Bullock-Webster.
Multiplex electrical signalling systems (6,097)—Western Electric Company (*Western Electric Company*).
Motor vehicles (6,475, 6,476, 64,777, 6,478, and 6,479)—J. A. J. Evans.
Vehicle wheel axle lubricating devices (7,069)—T. Armstrong.
Starting and lighting devices for automobiles, etc. (6,788)—J. Bethenod.
Steering self-propelled vehicles (7,092)—R. Brennan and J. O'Connor.
Systems of electric power transmission (6,987)—British Thomson-Houston Company (*General Electric Company*).
Braking apparatus (6,599)—F. M. Castleman and McKenzie, Holland and Westinghouse Power Signal Company.
Chassis for motor vehicles (7,141)—J. R. Churchill.
Fluid pressure braking apparatus (7,006 and 7,007)—J. W. Cloud.
Motor vehicles (7,215)—E. J. Detmold.
Two-speed with free engine gear for vehicles (6,597)—H. M. Edmonds
Locking means for change-speed levers of motor vehicles (6,746)—A. Gay and F. R. Ram.
Automatic point actuating mechanism for tramways, etc. (7,124)—A. Grandi.
Omnibuses and chars-a-bancs (6,920)—W. J. Hickman.
Starting gear for motor vehicles (6,548)—P. C. Jones.

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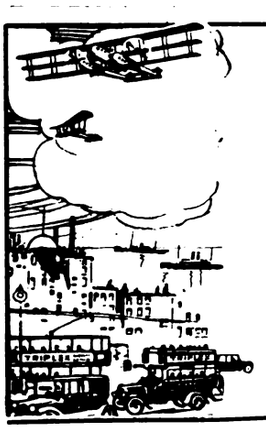
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Safety devices for motor cars (7,089)—R. N. Jones.
Petrol and lubricating oil gauge for motor vehicles (6,589)—S. R. Lakeman.
Automobile clutch locks (7,002)—P. E. Maurer and F. T. Snow.
Self-propelled vehicles (6,588)—W. M. Metcalf.
Means for connecting railway rails (6,925)—G. W. Miller.
Driving of motor cars (6,839)—A. C. Muir.
Steering gears of self-propelled vehicles (7,158)—W. Pugh.
Automobile worm geared driving axles (6,744)—W. L. Spence.
Splash guards for wheels of motor vehicles (6,554)—J. H. Stirk.
Mechanically propelled road vehicles (7,040)—E. R. Woakes.
Locomotives, rolling stock, and permanent way (6,759)—W. R. D. Shaw.
Electrically-driven vehicles (7,650)—H. J. Carey.
System of electric power distribution for trains (7,833)—P. Dawe.
Systems of automatic train control (7,612)—G. P. Finnigan.
Change speed and reversing mechanism (7,254)—M. Goudard and M. Mennesson.
Variable speed reduction gears (7,661)—E. E. Hardie and A. E. Steel.
Frictional driving gear for motor vehicles (7,901)—C. W. Harrison.
Motor vehicles (7,952)—T. J. Heskett.
Tramcar trolley heads (7,504)—R. Heywood and S. Smith.
Motor vehicles (7,740)—P. G. Hugh and G. Scammell and Nephew.
Steering gears for motor vehicles (7,802)—G. H. Jones.
Rear axles for motor vehicles (7,803)—G. H. Jones.
Trolley heads for electric tramcars, etc. (7,799)—S. K. Kirkland and H. R. Tidswell.
Motor vehicles (7,327)—E. C. R. Marks (*Cowan Truck Company*).
Self-propelled vehicles (7,328)—E. C. R. Marks (*Cowan Truck Company*).
Change speed gears for motor vehicles (7,691)—J. Milne.
Regenerative control of electrically-propelled vehicles or trains (7,583)—A. Raworth.
Transmission gear for motor vehicles (7,712)—C. S. H. Snow.
Suspension of motor vehicles (7,618)—Soc. Anon. Darracq.
Pedestal for tramcar trollies (7,408)—T. H. J. Thomas.
Railway and tramway chairs (7,912)—T. H. J. Thomas.
Spring systems for motor vehicles (7,477)—A. A. Watkins and Waverley Cars, Limited.
Control valves for fluid pressure braking apparatus (7,603)—Westinghouse Brake Company.
Fluid pressure braking apparatus (7,311, 7,312, and 7,313)—Westinghouse Brake Company (*Westinghouse Air Brake Company*).

Specifications Published.

1917.

Signal devices applicable as stopping and turning indicators for vehicles (19,023—*122,670*)—E. B. Roedding and E. Roedding.
Change-speed gear for motor vehicles (3,619—*104,873*)—A. E. Leymarie.

1918.

Permanent way of railways and tramways (3,535—*122,729*)—J. A. Roberts and United Alkali Company.
Controlling switches of combined ammeters and volt meters used in connection with dynamo lighting and battery charging systems of motor vehicles (14,154—*122,797*)—W. Holt and B. Brooks.
Motor road vehicles (2,563—*122,923*)—A. Horrocks.
Rear axle speed change gear for motor vehicles (2,830—*122,929*)—A. G. Canham.
Light motor road vehicles (8,544—*122,980*)—G. A. Dunball.
Means for steering motor vehicles (11,956—*122,998*)—F. L. Rapson.
Variable speed device (17,723—*123,034*)—S. Bobrovsky.
Means for controlling variable speed gears (3,596—*123,186*)—J. D. Dean.
Clutches for motor road vehicles (5,008—*123,208*)—J. D. Siddeley.
Tractor drive attachments for motor vehicles (5,144—*114,837*)—R. E. Gallagher.
Electrical speed controlling apparatus (5,774—*123,216*)—V. Bibire.
Chair for holding rails on railways (14,391—*123,282*)—D. John.
Change-speed gearing (713—*123,357*)—C. A. Allison (*Soc. Anon. H. et A. Dufaux et Cie.*).
Differential or balance gear for motor vehicles (2,979—*123,389*)—N. Isherwood and J. F. Withnell.
Apparatus for producing detonating signals for controlling the operation of trains and tramways (9,810—*123,470*)—W. L. Rowe.
Transmission gear for power-driven vehicles (1,682—*123,551*)—L. Murphy.
Variable speed gears (4,188—*123,607*)—A. E. Hudd and O. Thornycroft.
Carriage jack for motor vehicles (5,253—*123,625*)—A. Good.
Railway traffic controlling apparatus (6,342—*115,035*)—McKenzie, Holland, and Westinghouse Power Signal Company.
Chassis construction for motor vehicles (10,614—*123,681*)—C. M. Foster.
Change speed and clutching mechanism (20,798—*123,703*)—C. H. Strong.

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TRAFFIC RETURNS.

Tramway and Omnibus Undertakings in the United Kingdom.

NAME OF COMPANY OR CORPORATION.	1918. WEEKS ENDED.					1919. WEEKS ENDED.					AGGREGATE.		
	Mar. 2	Mar. 9	Mar. 16	Mar. 23	Mar. 30	Mar. 1	Mar. 8	Mar. 15	Mar. 22	Mar. 29	Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£	£	£	£
Aberdare U.D. Council	443	434	461	444	...	499	502	501	516	...	50	25,499	+ —
Aberdeen Corporation	2,172	2,237	2,204	2,127	...	2,438	2,577	2,497	2,578	...	42	108,756	+ 17,687
Ayr Corporation	331	315	342	352	...	396	394	419	424	...	44	24,464	+ 5,237
Belfast City	...	...	...	...	...	...	...	...	...	...	—	—	—
Birkenhead Corporation	1,916	1,885	1,893	1,946	...	2,039	2,167	2,215	2,159	...	51	110,986	+ 16,291
Blackburn Corporation	1,473	1,413	1,485	1,474	...	1,766	1,773	1,744	1,870	...	51¾	90,217	+ 14,196
Bradford Corporation	7,190	7,003	5,775	4,986	...	9,163	9,369	9,946	9,325	...	51	472,568	+ 88,188
Burnley Corporation...	1,932	1,995	1,960	2,080	...	2,577	2,629	2,715	2,768	...	—	—	—
Burton-on-Trent Corporation ...	373	366	362	374	...	396	402	415	433	...	51	21,058	+ 4,313
Bury Corporation	1,572	1,666	1,665	1,740	...	1,915	2,105	2,068	1,967	...	51	103,877	+ 20,080
Chatham and District	1,179	1,161	1,186	1,164	...	1,237	1,236	1,291	1,273	...	11	13,470	+ 479
Cork Electric	587	563	623	655	...	498	473	518	578	...	11	5,975	— 637
Derby Corporation	1,232	1,209	1,230	1,306	...	1,416	1,434	1,454	1,438	...	51	75,937	+ 13,488
Dundee City	1,588	1,547	1,566	1,558	...	1,980	1,997	2,018	2,063	...	44	86,283	+ 17,311
East Ham Corporation	1,291	1,241	1,343	1,315	...	1,543	1,520	1,714	1,674	...	50⅝	79,909	+ 10,694
Glasgow Corporation	26,825	26,794	27,650	28,130	...	28,444	27,916	29,459	29,113	...	42½	1,204,468	+ 88,300
Glossop (Urban Elec. Supply Co.)...	174	172	178	186	...	212	234	223	224	...	12	2,554	+ 426
Halifax Corporation	2,215	2,125	2,225	2,310	...	2,632	2,748	2,669	2,836	...	50½	141,410	+ 19,679
Halifax Corp. Motor Omnibuses ...	50	51	48	52	...	67	72	69	68	...	50½	3,384	+ 890
Huddersfield Corporation	3,134	3,103	3,208	3,350	...	3,642	3,541	3,602	3,657	...	51	184,596	+ 22,883
Ilford U.D. Council	762	800	793	807	...	1,016	1,053	1,062	1,043	...	51	51,286	+ 12,366
Ipswich Corporation	626	...	...	...	...	666	...	...	...	...	48	35,625	+ 3,899
Isle of Thanet	162	167	194	210	...	320	324	372	344	...	24¾	7,700	+ 3,379
Kilmarnock Corporation	213	216	225	222	...	263	263	269	265	...	44¾	11,879	+ 2,617
Lanarkshire	3,339	3,243	3,347	3,457	...	3,505	3,423	3,542	3,706	...	11	40,989	+ 5,155
Lancashire United	...	...	...	...	...	...	...	...	...	...	—	—	—
Leeds City	11,124	10,929	11,069	11,454	...	13,986	14,061	14,082	14,312	...	51	692,035	+131,064
Leicester Corporation	4,218	4,114	4,251	4,325	...	4,859	5,068	5,096	5,175	...	—	—	—
Leyton U.D. Council	1,722	1,692	1,779	1,786	...	2,482	2,632	2,662	2,659	...	51	121,963	+ 27,340
Liverpool Corporation	16,890	16,484	16,732	17,296	...	19,767	20,823	21,068	20,819	...	11¾	230,608	+ 38,790
Llandudno and Colwyn Bay ...	256	242	270	...	...	285	292	318	...	...	15	4,405	+ 873
London County Council	52,870	53,048	55,420	54,785	...	67,111	68,629	69,962	70,874	...	50½	3,357,824	+583,483
Maidstone Corporation	246	226	251	251	...	278	281	286	279	...	50½	14,376	+ 1,879
Manchester Corporation	23,517	23,041	23,695	24,340	...	26,143	26,953	27,481	27,617	...	51	1,336,283	+247,536
Newcastle-on-Tyne Corporation ...	8,577	8,452	8,495	8,906	...	8,140	8,317	8,270	8,487	...	51	449,520	+ 44,002
New St. Helens and District ...	...	...	...	...	...	...	...	...	...	...	—	—	—
Northampton Corporation	960	853	911	916	...	979	1,103	957	1,123	...	51	45,911	+ 2,498
Nottingham Corporation	4,868	4,650	4,802	4,782	...	6,424	6,406	6,478	6,617	...	51	296,572	+ 66,238
Oldham Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
Reading Corporation	1,145	1,088	1,203	1,147	...	1,324	1,351	1,390	1,330	...	50½	65,998	—
Rhondda Tramways	1,609	1,552	1,706	1,633	...	2,103	2,104	2,119	2,150	...	11	23,210	+ 5,603
Rotherham Corporation	1,901	2,000	1,981	2,046	...	2,054	2,060	2,030	1,997	...	51¾	116,277	+ 20,877
Sheffield Corporation	12,854	13,008	12,916	13,712	...	12,558	15,528	15,979	15,873	...	51¾	691,354	+ 55,746
Southampton Corporation	2,252	2,209	2,305	2,262	...	2,350	2,421	2,472	2,462	...	50¾	126,444	+ 20,237
Southend-on-Sea Corporation ...	644	640	698	676	...	1,112	1,167	1,185	1,213	...	50	65,625	+ 22,159
South Shields Corporation... ...	...	...	1,014	...	...	...	...	1,203	...	...	50	57,737	+ 9,276
Sunderland Corporation	2,031	2,039	1,943	2,090	...	2,742	2,715	2,793	2,756	...	51	114,895	+ 18,995
Swindon Corporation	288	268	294	284	...	290	291	288	291	...	50¾	15,396	+ 1,495
Torquay Tramways	704	607	708	721	...	730	775	752	814	...	11	8,114	+ 646
Tyneside Tramways and Tramroads	897	847	895	902	...	819	847	843	896	...	12	9,189	— 215
Wallasey Corporation	1,473	1,437	1,484	1,564	...	1,886	1,992	2,029	2,024	...	50⅝	96,032	+ 16,623
Walsall Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
Walthamstow U.D. Council ...	1,128	1,113	1,201	1,237	...	1,393	1,464	1,458	1,423	...	51	72,991	+ 11,382
Warrington Corporation	770	736	739	725	...	824	823	879	851	...	51	39,949	+ 8,793
West Ham Corporation	3,592½	3,614	3,733	3,683	...	4,743	4,731	4,872	4,888	...	50½	233,152	+ 47,816
Wigan Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—

*** A number of undertakings suspended the issue of traffic returns for the duration of the war.

Colonial and Foreign Tramway Traffic Returns.

NAME OF COMPANY.	1918. WEEKS ENDED.					1919. WEEKS ENDED.					AGGREGATE.		
	Mar. 2	Mar. 9	Mar. 16	Mar. 23		Mar. 1	Mar. 8	Mar. 15	Mar. 22		Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Anglo-Argentine	56,938	57,977	56,612	56,890	...	58,381	60,757	64,218	62,116	...	12	674,459	+ 22,898
Calcutta ... ... Rs.	74,605	77,376	76,204	72,593	...	88,622	90,051	88,850	82,752	...	11½	1,008,221	+154,037
Madras ... ... Rs.	...	...	...	...	...	...	...	...	...	...	—	—	—
Pernambuco	4,347	4,726	4,726	4,615	...	5,421	5,686	5,275	5,281	...	11¾	62,159	+ 6,116

Companies issuing Monthly Statements only.

	1917.		1918.				1918.			1919.			Wks.	AGGREGATE.	
	Oct.	Nov.	Dec.	Jan.	Feb.	March.	Oct.	Nov.	Dec.	Jan.	Feb.	March.		1918-19.	+ or —.
	£	£	£	£	£	£	£	£	£	£	£	£		£	£
Ballarat & Bendigo	3,546	3,405	3,228	4,505	...	...	3,690	3,570	3,884	4,504	...	...	40	35,478	+ 2,167
Brazilian Trac. Mlrs	8006000	7695000	8069000	7837000	...	...	8052000	7581000	8531000	8522000	...	...	52	101894000	+9,694,000
Brisbane	33,580	32,901	35,019	34,500	...	...	36,780	39,246	38,135	38,575	...	...	4	38,575	+ 4,075
British Columbia	$491,964	525,629	555,555	559,569	501,150	...	580,354	612,893	691,065	667,489	645,415	...	34	4,740,999	+ 756,620
Buenos Ayres L'c'z.	39,067	39,678	40,901	38,902	34,397	...	41,843	42,952	50,460	41,556	42,429	...	34	343,209	+ 39,434
Burma	28,955	27,760	26,224	25,430	22,985	...	34,848	34,407	34,593	38,265	35,926	...	30	250,730	+ 66,495
Cape Town	17,128	16,522	...	...	...	...	13,877	18,385	...	...	...	...	—	—	—
Carthagena & H....	2,805	3,932	4,424	4,011	4,031	5,316	2,525	2,988	2,950	3,655	2,351	2,400	13	8,406	— 4,952
Cordoba	...	...	...	12,844	...	...	...	...	...	13,942	...	...	44	145,654	+ 10,915
East India	1,229	871	1,099	1,176	1,318	...	2,044	1,947	2,048	1,970	1,689	...	30	13,612	+ 4,845
Kalgoorlie	2,795	2,641	...	...	...	...	2,835	2,933	...	...	...	...	48	30,838	+ 1,274
La Plata	4,069	3,742	4,606	4,711	4,746	5,348	5,177	5,334	5,792	5,730	5,698	6,592	13	18,019	+ 3,216
Lima	37,612	37,249	43,198	43,561	...	...	45,336	44,948	47,887	45,362	...	...	4	45,362	+ 1,801
Manaos ... Rs.	...	...	...	...	...	...	...	...	...	...	...	...	—	—	—
Manila ...	$157,400	159,000	169,000	167,000	...	...	214,898	214,292	236,612	231,585	...	...	52	2,326,884	+ 525,609
Monte Video ...	30,153	...	34,025	36,016	34,573	36,659	33,203	...	38,441	40,910	38,772	41,070	21	190,891	+ 18,558
Peruvian ...	$1047220	899,680	1101090	1189350	925,410	...	1090815	897,090	1057990	1009650	943,470	...	34	7,973,835	— 229,195
Para	...	...	23,315	24,060	...	...	...	...	23,800	24,515	...	...	8	48,315	+ 940
Port Elizabeth ...	3,885	3,807	...	...	...	...	2,751	3,498	...	...	...	...	—	—	—
Rangoon	5,667	5,358	5,438	5,361	5,662	...	6,566	6,611	6,188	6,373	5,694	...	8	12,067	+ 1,044
Toronto ...	$1043886	1052000	...	1068319	981,933	...	1048478	1071106	...	1106840	1015797	...	8	2,122,637	+ 72,385
Winnipeg ...	$301,772	305,881	...	334,642	298,899	...	295,005	283,721	...	390,539	371,162	...	8	761,701	+ 128,160

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The Daimler is not the only serviceable lorry on the road, but however good other vehicles may be they must all fall short of Daimlers in relation to engine performance and continuity of service.

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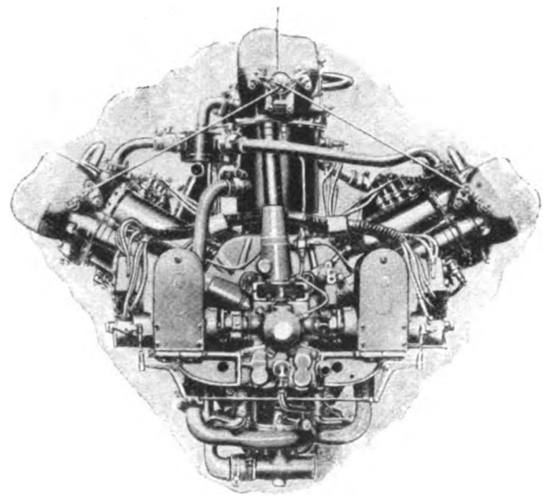
NAPIER

BRITISH BUILT



¶ The Napier was the original six-cylinder car—since copied throughout the world.

¶ The Napier Aero Engine is the FIRST AND ONLY engine that has attained an altitude of 30,500 feet. This astounding world's record is the more remarkable having regard to the fact that the **total weight of the machine, pilot and observer, with load, was 1 ton, 10 cwts., 80 lbs.**

¶ As a precursor of this remarkable world's record, it is interesting to note that the Napier Car was the FIRST AND ONLY British Car to have won the International Gordon-Bennett Trophy.

¶ Again—the Napier six-cylinder is the FIRST AND ONLY car to have conquered the European Alps under the official observation of the Royal Automobile Club.

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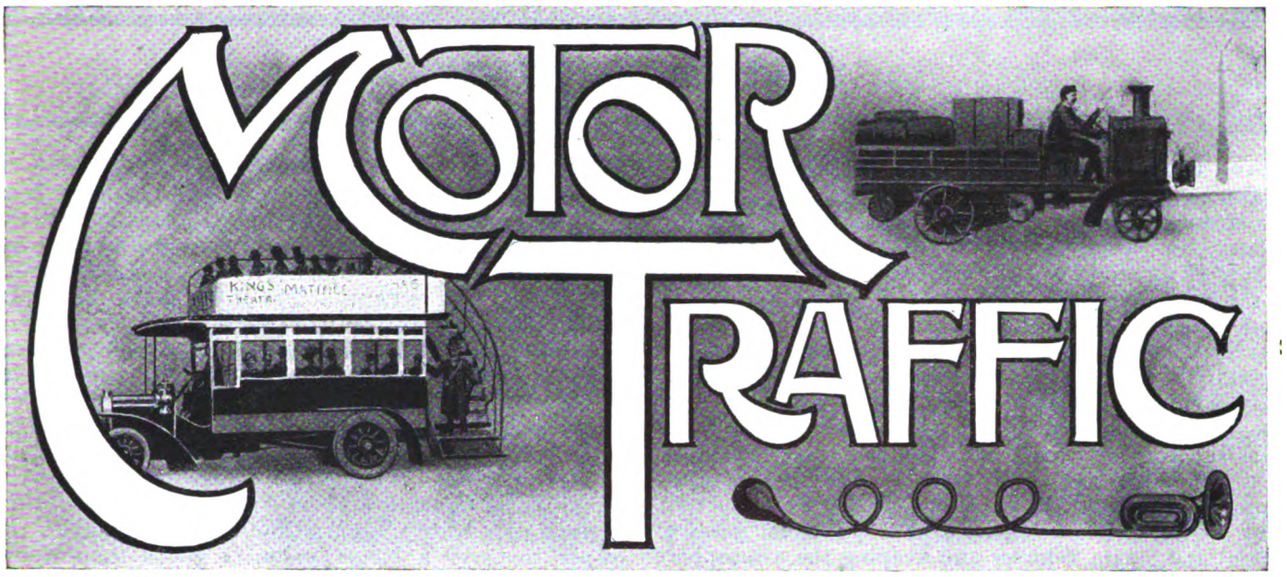

THE SLOUGH MOTOR DEPOT.

There was a similarity in the defence by Government in both Houses of Parliament of the determination to proceed with the erection of the motor repair depot at Slough that bodes ill in more ways than one. We are surprised that none of the experts of the industry in the Commons was courageous enough to point out the unsoundness of the latest argument with which Lord Inverforth and Mr. Churchill sought to bolster up the waste of money that the scheme has entailed. Both the Minister of Munitions and the Secretary for War suggested that when the Ministry of Munitions gives place to the Ministry of Supply it will be the duty of the new department to furnish motor vehicles to the War Office, the Admiralty, the Post Office, the Office of Works, the Stationery Office, and other departments. The Government's defender in the Upper House also suggested that it would be a matter for the Ministry of Ways and Communications to consider whether advantage could not be taken of the depot to secure the greater facilities for road transport, whether of passengers or goods, required for opening up the rural districts. These suggestions constitute a further menace to the industry which more than any other trade contributed to the winning of the war. The disclosure of the Government's proposals indicates the desertion of the loudly proclaimed intention not to continue the ownership of any national factory to be engaged on work that would compete with private enterprise. When the renovation of the 80,000 vehicles acquired for war purposes has been effected, what task will there be to occupy the attention of the Slough depot, which covers an area nearly twice the size of Hyde Park? No doubt a considerable number of the vehicles will be handed over to the departments already mentioned, but the total will not be large enough to justify the retention of the depot. Consequently the next step will be to start manufacturing, thus dealing another blow at the British motor industry, which, as the result of working for the Government during the past four and a half years, has to recover its home and foreign trade.

* * * * * *

The looseness of the Government's consideration of the problem is shown by Lord Inverforth's statement that it is estimated that the repair of the 45,000 British cars and lorries would take "two, three to four years," if entrusted to the British manufacturers; but he did not venture to indicate how long Slough will require to renovate the 35,000 non-British cars for which it was proposed from the first that the Government should be responsible. Nor did he attempt to say what period will be occupied by the Slough magicians in repairing the British-made machines. It is to be feared, however, that the delay will be so prolonged that many of the vehicles will be out of date. Consequently, still less reliance is to be placed upon the new peer's assertion that "if the repair part of the scheme is completed, and our motors repaired, the difference in the disposal value will be sufficient to show a profit of £1,200,000." The probability is that the State-repaired cars and lorries would be a drug in the market, their sale being killed by the enterprise of manufacturers supplying a superior machine, replete with improvements suggested by war experience. This would give manufacturers some set-off against the loss of the opportunity of supplying their goods to the Government departments. We need not comment here on the tactics of the Government in seeking to divide the House of Commons after Mr. Churchill had welcomed the opportunity of joining the House of Lords in their decision to set up a Select Committee of Inquiry. The manœuvre was readily understood by the Commons, which has much to complain of in the treatment it has received in its attempts to deal with the matter. It is to be feared that the investigation will come too late to effect any reduction in the waste of £1,100,000 already expended, but it is possible that the report may have the effect of curtailing the range of the activities of the Slough depot. The proper course to pursue would be to retain only sufficient of the works to provide for the requirements of the army and navy, and to sell the remainder of the buildings and site. That step ought to have been taken when the armistice came into operation, instead of placing the work in the hands of a contractor to complete. The least that could have been done in justice to the taxpayers was to adopt the suggestion contained in the report of the Select Committee on Expenditure in November last, namely, that the estimates should be submitted to independent expert examination, and that the Government should review the question of proceeding with the works. That recommendation was ignored, although the present gigantic scheme was not contemplated in June, when the Commons permitted the continuation of the proposal to erect works to take the place of those jeopardised in the German advance.

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MOTOR TRAFFIC

MOTOR TRAFFIC AND THE CHANNEL TUNNEL.

During the last few weeks the prospect of the early construction of the Channel Tunnel has come much nearer, and there arises the question whether such a tunnel should provide for a roadway in addition to a railway. The difficulty in the way of effecting this undoubted extension of its utility is considerable. As the railway traffic through the tunnel will be operated electrically, the problem of ventilation will be very much simplified. A roadway would be of little use unless its service were available to all vehicles which required to use it, or at any rate to all mechanically propelled vehicles. At the best the journey through the tunnel by road would not be attractive, and the problem of disposing of the exhaust gases of petrol and steam vehicles and keeping the atmosphere reasonably clean would be a very troublesome one. Obviously the provision of a roadway would add very materially to the cost of the construction of the tunnel, and probably also to the time spent before it was completed and ready for traffic. Altogether, it is questionable whether anything more than a railway is really justifiable, but if this is the decision reached by those who have the determining voice, thoroughly adequate arrangements must be made for the prompt transport of road vehicles from one end of the tunnel to the other. There must be a well thought out organisation by means of which motor vehicles can be run straight on to suitably designed trucks and adequately secured in position. The organisation should be such that trucks will not be kept waiting standing about, but will be hitched on to the next train and taken through without delay. There must be no stupid regulations about the removal of all fuel. Nothing of the kind should be necessary, and what is required is to drive the car on to the truck under its own power, and when the journey is completed to remove it again under its own power without delay. A system of this kind would be very useful in assisting the establishment of direct services by road between this country and the north-west of Europe.

"MOTOR TRANSPORT SYSTEM WILL HOLD ITS OWN."

With reference to the proposal for establishing light narrow gauge railways in the agricultural districts, Sir Eric Geddes made some interesting remarks in his speech on the Transport Bill, showing that at least so far as he is concerned one form of this scheme is hardly likely to find favour. He was largely responsible for the extension of these light railways in the army zones in France. The lines were intended, however, as temporary expedients, and the cost of maintenance of one class of such tracks would, in the opinion of the future Minister of Transport, be so heavy that their use in agricultural districts would be throwing away money. In certain places light railways might prove effective, but their application could not be general. It is suggested that in this country light electric railways may be employed for interurban traffic. On the other hand, in the agricultural areas a big development of motor traction may be expected under the new Ministry. Such districts can be better opened up by roads than by any form of light railway, particularly where gradients are frequent and severe. As Sir Eric Geddes says, "The motor transport system held its own in France and will certainly hold its own in this country."

PRICES OF POST WAR MOTOR VEHICLES.

In some quarters unreasonable attacks have been levelled against the British motor industry on the grounds that it is asking exorbitant prices for post-war products. The commercial vehicle user is more reasonable. He recognises that as the price of his own product has gone up, he must expect that the price of the machinery he purchases will have gone up also. Roughly, as regards the substantial commercial vehicle, we have to face an increase of 50 or 60 per cent. Perhaps the fairest way of looking at the matter is to consider not only cost of the vehicle, but the selling value of the load which that vehicle carries. If the selling value of a full load be double what it was, then a given expenditure upon a motor vehicle enables the owner to carry a bigger value of goods than would have been possible by that same expenditure in the past. Then, too, first cost is not the only item which a motor user has to consider. Operating cost is still more important, and amounts in the aggregate to a far larger sum. Allowing for increase in first cost, and for other increases in such costs as wages and fuel, it will be found that the total expenditure involved per mile has gone up by about 50 per cent., or, in the case of a three-ton vehicle, say from 8d. to a shilling. Suppose that in this machine there is carried a load of three tons of some commodity previously worth £20 a ton, and now worth £40 a ton, and that it has to be conveyed over a distance of thirty miles, the extra cost of transport is 10s, the original cost being about 20s. Thus, on the old figures, transport added about one-sixtieth to the price which had to be charged for the stuff, bringing it up to £61 instead of £60. With the new figures, the addition of 30s. for transport puts the total up from £120 to £121 10s. In this case transport has added only one-eightieth to the cost. In fact, it represents a smaller percentage than it did a few years ago. If each case were analysed in this way, it would be found more often than not that the percentage of cost due to transport has gone down, despite the increased price of the vehicle and of its fuel.

* * * * * *

A great many people make the mistake of confusing the cost of a car with the total cost of motoring. Such confusion leads to the assumption that if, say, the cost of a car is doubled, then the cost of motoring is also doubled, and a great many people can no longer afford to indulge in it or to utilise motors in connection with their trade. A very simple example will show how incorrect this reasoning is. A motor omnibus may cover perhaps four hundred miles a week for fifty weeks in a year, and if it is well constructed it will probably last eight years, giving a total of 60,000 miles. If the aggregate cost, inclusive of depreciation allowance, which enables the first cost to be written off, is taken as a shilling a mile, we have a total expenditure of £8,000 on operating costs during the life of the vehicle. Suppose that the first cost has gone up from £600 to £1,000. Then this rise is responsible for a total increase of £400 in the costs incurred altogether. This represents only a rise of 5 per cent., from which it is seen that a very substantial increase in the first cost of the vehicle only corresponds to a comparatively trifling percentage increase in the total expenditure involved by its purchase and operation.

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MOTOR TRAFFIC

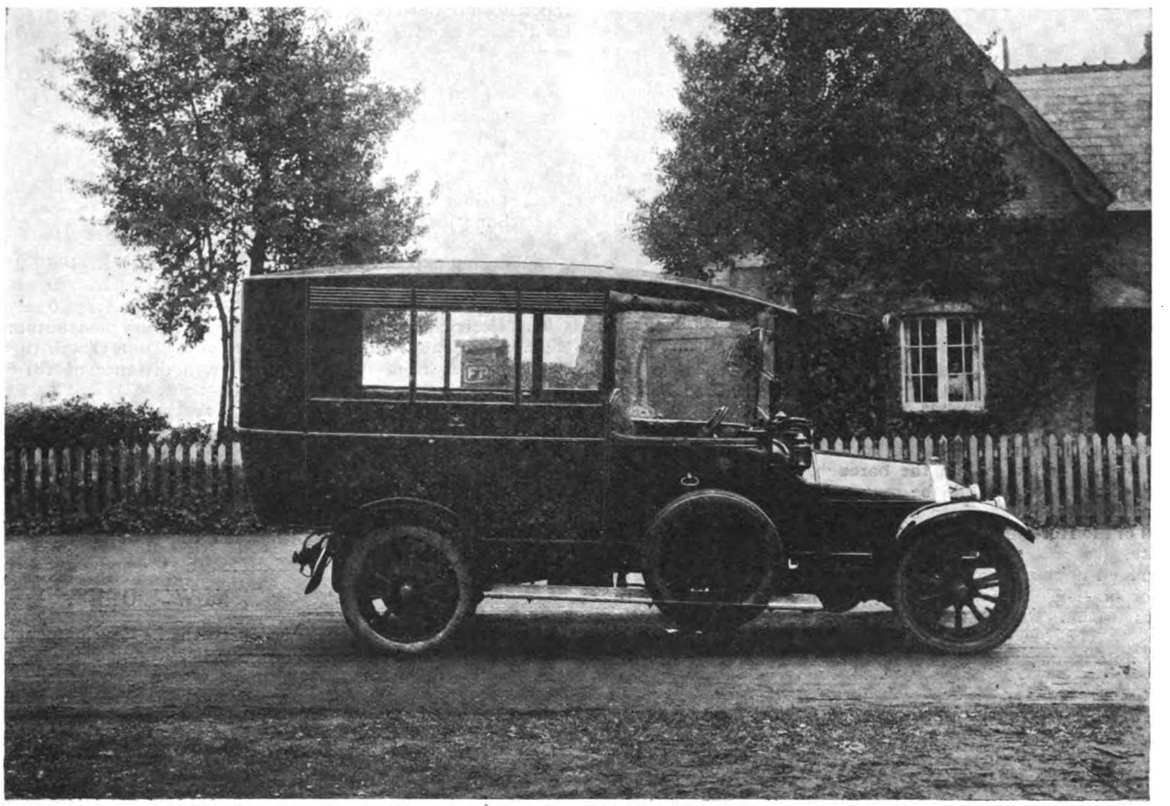
SOUTHAMPTON'S DEPARTMENTAL OMNIBUS.

A Profitable Investment by Corporation Tramways.

The appended photograph shows a departmental omnibus which has been acquired by the Southampton Corporation Tramways Committee. The body was designed and built by the department, and the chassis is a 30-H.P. Lancia, which was purchased from Messrs. T. Greenwood and Sons, of Halifax. On good surfaced, straight roads it is capable of a speed of 40-50 miles an hour, which gives it a great margin for acceleration in the important duties on which it is constantly engaged. These tasks are constantly being added to, for the vehicle's existence has become thoroughly known to all departments of the Corporation, who are eager to use it for purposes of inspections, deputations, and other municipal duties, for which it is made available at any time.

The covered interior gives accommodation for as many as eleven passengers, and it is this considerable capacity that gives the conveyance its great value. In the words of Mr. W. T. Robson, the general manager, "it is becoming more and more obvious that a vehicle of this description is quite invaluable to the Corporation, both as a convenience and economically." The charges are based on a similar scale to that adopted by motor cab proprietors, but as the omnibus carries as many as three taxi loads the department is able to arrange the hire terms at a much more favourable price.

Among the daily uses to which it is put by the tramways department are the banking of cash, taking the women conductors home at night to outlying districts, and linking up the depots. Recently it has been found useful for conveying members of the Corporation to the docks for civic farewells to overseas fighting forces—British and American—who are leaving Southampton for home almost weekly.



Southampton Corporation Tramways' Omnibus for General Service.

Petrol Supplies.—Mr. Bridgeman stated in the House of Commons that the trade stocks of motor spirits in the United Kingdom on January 1 last were 28 million gallons, and on February 1 24 million gallons, these figures showing a considerable increase as compared with the previous year. Some reduction in the price of motor spirit had been recently effected, and the prices now fixed are maximum prices, and not, as was formerly the case, prices below which spirit could not be sold.

ELECTRIC VEHICLE PROGRESS.

The March-May issue of the *Electric Vehicle* indicates the vitality of the battery transport movement in this country under the care of the Electric Vehicle Committee of Great Britain. Now that the paper supply situation has become easier, the publication extends to 48 pages, the majority of which contain articles and news showing that despite the war electric road conveyances have achieved encouraging progress. In view of the difficulty of obtaining parts from America during the last two years, there is a great opportunity for manufacturers in this country to take up work in connection with the battery vehicle. It is satisfactory therefore to note, from a five-line paragraph occupying a modest corner in this issue of the journal, that Messrs. Worsnop and Company, Limited, of Halifax, are building a new factory, covering 8,000 square yards, for the manufacture of accumulators of the nickel steel type for electric trucks and vehicles.

In an article dealing with the Ministry of Ways and Communications, the editor says:—"Any attempt by a Government department to fix the frontiers of railways, light railways, tramways, and motor vehicles would be most ill-advised. There is little likelihood that the Ministry will interfere in any way with the particular types of urban and suburban transport for which the battery-driven vehicle is adapted. But electric omnibuses and electric inter-urban services are both liable to control, and in these directions it may be necessary to take steps to secure the open road which is so essential to a new development. With regard to omnibuses, the chief legislative point at issue is that of licensing. There is little stability and no uniformity about the existing arrangements, and it would certainly be an advantage if the terms on which licences are granted could be standardised on a basis which would give reasonable security and freedom."

Commenting upon the demand for improved conditions by transport workers, another article indicates numerous directions in which running costs can be reduced and more goods handled by the adoption of battery vehicles.

U.S.A. War Vehicles in France.—No decision has been arrived at with regard to the disposal of the 85,000 cars and lorries in use by the United States Army in France.

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MOTOR TRAFFIC

LONDON AND SOUTH COAST SERVICE.

REFUSAL OF LICENCES AT BOURNEMOUTH.

Bournemouth Corporation recently refused an application by the Bournemouth and District Motor Services, Limited, for licences to enable them to run omnibuses to connect the town with all the surrounding villages, the fares in the borough to be 50 per cent. over and above the tramway fares. This procedure, the company stated, had been effective in preventing competition with tramways in other towns, and relations with various tramway authorities had been most cordial. The communication added that there was a direct service from Chatham to Hastings of 42 miles, and previous to the petrol restrictions the Brighton service ran east to Eastbourne, north to Handcross, and west to Southsea. These are now being resumed with an extension to Southampton, and it is hoped eventually to link London with the South Coast from Margate to Weymouth, the greater part of which is already covered. With regard to the roads, in the company's opinion they are quite suitable for the traffic—in fact, more so than in many towns which have both omnibuses and tramways. A single-deck omnibus of the pattern proposed is more easily managed than the present type of motor chars-a-banc. The company states that it is not absolutely necessary to have fixed places for stopping, as this takes less than one minute, the only place requiring a longer stop being at the terminus, which it is suggested would be arranged in the Square. The company would not pick up and set down the same passengers in the borough.

Before the Council came to a decision, the borough engineer reported that the highways were not constructed and are not suitable for traffic such as the institution of a motor omnibus service would involve, and that it was impossible at the present time to spend large sums on repairs or alterations to the highways which the normal use of the roads does not require. The Council were also influenced by the consideration that the time is altogether inopportune for the initiation of such an undertaking and the sufficiency of the existing means of locomotion both in and without the borough.

In a report by the town clerk it was stated that the Council, under the omnibus by-laws, granted licences for three classes of omnibuses, A, B, and C.

Omnibus of "Class A" means an omnibus starting from within the borough and going to a place or places outside the borough, and not intended to take up passengers to be set down on the route taken by such omnibus within the borough. It is Class A omnibuses for which licences would be required in connection with the present proposals. As to these by-laws, they are under the consideration of the Horse Committee with a view to their being brought up to date.

The Council is empowered, under Section 20 (1) of the Bournemouth Corporation Act, 1904, "to provide, maintain, work and run omnibuses within the borough . . . in extension of their tramways." The town clerk did not consider that the Council would be able to obtain powers to run omnibuses in the way suggested by the company.

Points which the Joint Committee would no doubt consider were :—

(*a*) The question of the necessity of the proposed service, having regard to—

(1) The existing facilities provided by the tramway service as to Poole and Christchurch.

(2) The railway facilities as to these and the more outlying districts which the new omnibuses would serve; and

(3) The service already provided or to be provided by the 50 (or thereabouts) chars-a-bancs which the Council have already determined to licence for service between Bournemouth and towns and places within a fairly comprehensive area.

(*b*) The effect upon the roads of the borough, to whose upkeep the company proposing to run the new service would not directly contribute.

As to this the members will have seen from the recent reports of the Roads Committee that a very large expenditure is now needed upon the roads owing to their necessary neglect during the period of the war.

(*c*) The effect upon the tramways permanent way. This also will necessitate in the near future a very large expenditure, owing to the impossibility during the war of having maintained it in an efficient condition, and this expense will, of course, fall at a time when every economic condition would point to delay, if delay were longer possible.

As to the legal position of the Council with regard to omnibuses, their powers were derived under Section 37 of the Town Police Clauses Act, 1847, as extended by the Act of 1889. The Council might license such a number of omnibuses as they thought fit. He also stated the effect of the judgments given in cases in which Blackpool and Brighton Corporations were concerned, and said that each case must be considered on its merits and no general rule must be laid down. The Horse Committee recommended that the application be not entertained for the following and other reasons:

(*a*) The opinion of the borough engineer—with which the committee is in agreement—that the roads of the borough are not constructed and are not suitable for such additional traffic as the institution of the proposed service would involve.

(*b*) That the additional service would very seriously and prejudicially affect the amenities of the town from a general traffic point of view.

(*c*) That it is quite unnecessary, having regard to the facilities already provided by (1) the railway service; (2) the tramway service, which will now, under the more favourable conditions, very shortly be greatly improved; and (3) the service of motor chars-a-bancs which the Council have just recently decided to extend to the licensing of 50 cars.

BATTERY VEHICLE COSTS AT STOKE.

Mr. C. H. Yeaman, borough electrical engineer of Stoke-on-Trent, reporting on the cost of operation of a 3½-ton Edison tip wagon for the six months ended June 30, 1918, gives the detailed figures as follows :—

Miles run				1,930
Tons of fuel carted				2,743·14
Current at ½d. per unit ...	£9	3	9½	
Repairs (mechanical)	13	9	4½	
Repairs (battery)	2	19	8½	
Driver's wages	68	3	2½	
Loader's wages	67	0	6½	
Sundries	5	5	7½	
Working expenditure	£166	2	3	
Cost per mile run	0	1	8½	
Cost per ton carted	0	1	2½	

The electricity department obtained delivery last autumn from Messrs. Ransomes, Sims and Jefferies of a 3½-ton Orwell tip wagon. It was driven from Ipswich to Stoke, a distance of 181·8 miles. The log of the run is as follows :—

Total ampere hours put into battery	1,587
Total units put into battery (approximately) ...	149
Ampere hours used per mile	8·74
Units used per mile	·82
Total running time	23 hrs. 34 min.
Average number of miles per hour	7·74

The total weight of the vehicle was 4 tons 14 cwts.

STRAKER-SQUIRE NEW WORKS.

An outstanding feature connected with the development of the motor industry since the cessation of hostilities, is the acquisition by the above-named company of the Government Aircraft engine Factory at Edmonton. The factory is located adjoining Edmonton station, which is reached in 25 minutes by rail from Liverpool Street, and sidings are already laid so that material coming from the North is trucked right into the works. The factory, constructed within the last two years, is a magnificent stack of buildings of brick and glass, all arranged and schemed on the latest up-to-date practice. A more important or imposing works, standing in 14 acres, it would be difficult to conceive, and certainly must be ranked as one of the most important motor factories in this country.

It is with this object of producing on a much larger scale than in pre-war days that Straker-Squire Limited have secured these extensive facilities. With the disruption of all motor factories, due to the war, the change-over to peace conditions obviously entails some delay in production, so that new types cannot well be expected to come through previous to the next November Show, when the new Straker-Squire "Six" will be on exhibition. In selecting a 6-cylinder type, this company will no doubt secure signal success, as with the aeroplane experience which they have acquired, it now becomes possible to produce a car of more efficient and lightened construction than was conceivable in pre-war days. This car is deduced largely on aeroplane lines, and is a development in that direction rather than on motor car design. The engine of this car certainly gives a remarkable performance, as on the dimensions of 80 mm. bore by 130 mm. stroke, 70 B.H.P. is obtained. This motor is a beautiful piece of work, and in its construction the most accurate and perfect workmanship is employed. The chassis is replete with the same light-weight principles, thus providing great reserve of power and highly efficient braking facilities, and the car altogether has the appearance of super-work. In future issues we intend to publish the designs of this chassis.

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MOTOR TRAFFIC

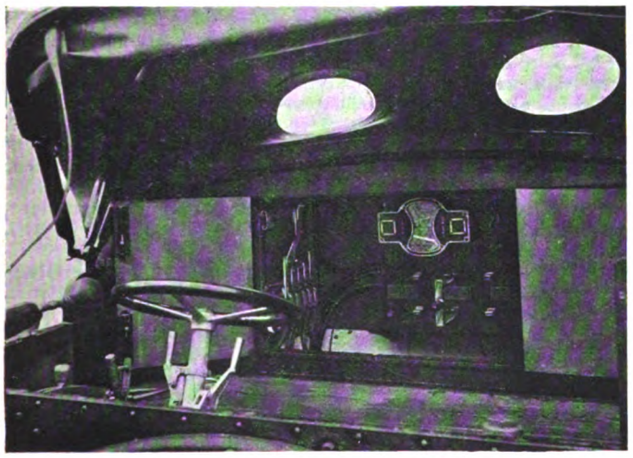
TILLING-STEVENS ARC WELDING MACHINES.

It has been claimed for the Tilling-Stevens petrol-electric vehicle that passenger-carrying is its peculiar speciality. There can be no question that the smoothness with which the vehicle will accelerate from a standing start to top speed, and the extreme simplicity of control, renders it specially suited for all kinds of passenger work, especially in large towns where frequent stops are a regular feature

Tilling-Stevens Standard Arc Welding Machine.

of the service. The field for the economic use of petrol-electric vehicles is, however, very much wider than passenger carrying, important as this class of business undoubtedly is. From the fact that each vehicle constitutes a complete electric generating plant, it will be seen that there are many uses to which the system lends itself, one of the most important being arc welding. In previous issues some account has been given of the development by Messrs. Tilling-Stevens in conjunction with their standard petrol-electric chassis of a complete arc welding outfit, the engine and dynamo which normally propel the vehicle providing the necessary current.

Three types of machines have now been standardised. In one instance the chassis is fitted with an ordinary lorry type body, and at the back of the driver's cab a compartment is provided to contain

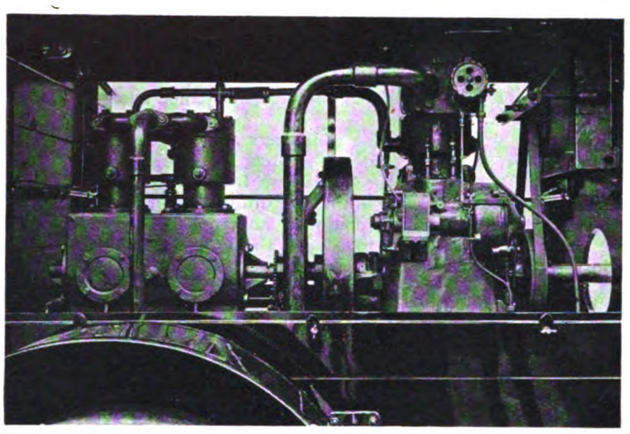


View showing Control and Resistances.

the necessary control gear and apparatus, thus enabling the vehicle to be used as a mobile arc welding plant, as well as an ordinary lorry. Another type has a box body fitted, which serves as a mobile workshop and mess-room for the operators, the welding gear being housed as in the lorry type. Each of these types are fitted with equipment suitable for supplying one arc. A third type of machine is now being fitted with equipment for supplying two arcs, one from the driving engine and dynamo and the other from a direct coupled petrol-electric set fitted in a specially ventilated box type body.

The type of machine illustrated in Fig. 1 is equipped for the supply of one arc and has been fitted with a body specially designed to suit the requirements of Messrs. P. A. Mudd and Company, who make a speciality of arc welding. The switchboard and necessary regulating resistances for welding are placed in a compartment immediately behind the driver's cab. This is enclosed by folding doors, access being obtained from the back of the driver's seat. Fig. 2 gives a view of the switchboard through the open doors. Behind the switchboard on each side of the vehicle are cupboards and lockers which contain the spare cables, electrode holders, head and hand screens, pneumatic hose, chipping hammers, etc. In the rear compartment a pneumatic compressor plant is housed; this was supplied by Messrs. Lacy-Hulbert and is capable of supplying air for operating a No. 1 Boyer pneumatic hammer.

The sides of the body are made in the form of shutters, and can be lifted off, thus giving free access to the plant. Our illustration Fig. 3 gives a view of the compressor plant, with the shutters removed. The car is completely equipped with electric lighting, this includes head lamps, side and tail lamps, a light over the switchboard in the cab, and also a light in the compressor compartment.



Pneumatic Compressor Plant.

At the present time Messrs. Tilling-Stevens have a considerable number of orders in hand for arc welding plants from shipbuilders and ship repairers, as well as a number of companies who make arc-welding their speciality.

ELECTRIC VEHICLE COSTS.

The Midland Railway Company have furnished to the *Commercial Motor* the running costs of some of their large fleet of battery propelled road vehicles, which range from a 15-cwt. van to a 5-ton lorry. Exclusive of drivers' and attendants' wages, the cost per mile on a 10,000 gross basis—excepting the 15 cwt. size, which is given a 5,000 gross mileage basis—is as follows:—15 cwt. van, 4·61d.; 30 cwt., 3·95d.; 2 tons with Ironclad-Exide batteries, 5·73d.; 2 tons with Edison battery, 5·3d.; 3½ tons with Ironclad-Exide battery, 6·74d.; and with Edison battery, 6·76d. Tire upkeep for the same gross mileage averages per vehicle, £6 8s., 15 cwt. van; £16 5s., 30 cwt. van; £22 10s., 2 ton van; and £32 for the 3½ ton vehicles. Repairs in the same order are assessed at £9 11s., £16, £20, and £25, and maintenance and attention to batteries, £4 6s., £4 6s., £10 (Edison battery 2-tonner), and £11 (Ironclad-Exide 2-tonner) and £11 (Edison battery 3½-tonner), and £12 (Ironclad-Exide battery 3½-tonner). As there is a disparity in the above prices relative to battery upkeep, the company reports that either type can be relied upon to give satisfactory results.

Omnibus Service for Walsall.—Terms have been arrived at between Walsall Corporation and the Birmingham and Midland Omnibus Company under which the latter will be allowed to run omnibuses within the borough. It will be remembered that the dispute recently occupied the attention of the High Court.

Goods of Enemy Origin Barred at Olympia.—The Society of Motor Manufacturers and Traders has decided that no goods of enemy origin will be allowed to be shown at the forthcoming motor exhibition to be held at Olympia in November next. This decision refers to cars, parts, fittings, tires, and all accessories.

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MOTOR TRAFFIC

GAS FUEL ON G.W.R. MOTORS.

In a report contributed to the March issue of the *Great Western Railway Magazine* on the experiments in the use of coal gas as fuel for road motor vehicles, the Motor Car Department state that the use of compressed gas has not made the progress expected, partly because of the difficulties in the way of changing the cylinders and partly owing to present-time difficulty in obtaining suitable cylinders. While compressed gas probably has a definite future in towns where charging stations may be set up or depots established at which exhausted cylinders can be exchanged for charged ones on the hire system, it is doubtful whether the utilisation of coal gas promises much in the direction of rural road motor services. The 27 road motor services operated by the company are, generally speaking, of long distance nature and serve isolated rural and seaside districts in similar manner to branch lines; the flexible roof container has, therefore, been adopted as the most suitable method for carrying the gaseous fuel.

The type of container which has been standardised is made double like a football, the interior gas-tight bag being of red rubber and the exterior casing of rubber-treated canvas. The advantages are (*a*) that all wear from rubbing takes place on the outer envelope, which can be easily repaired, and (*b*) that hot weather does not melt the solution in the seams, which are the weak points of a container made of rubber-treated canvas only and are pulled apart by the gas expansion.

The trays which carry the containers are designed to allow the latter to rest on slings made of webbing, and are so set up as to prevent the bottoms of the containers from rubbing on the roofs of the vehicles and also to allow free drainage and a current of air to pass between bottom of container and roof of body; otherwise the outer container tends to rot with damp at the bottom. The sides and ends of the trays are made as high as the entrances to the company's standard garages will admit so as to protect the containers as much as possible from the winds met with on routes which run over hill tops.

The problem which has given the most trouble has been the anchorage of the containers. These being of constantly varying capacity, rubber cords were first used, but they snapped off in high winds and drivers had to chase their containers over adjoining fields. Straps made of cord, webbing, and Balata belting, with and without battens of wood across the tops of containers, have been tried out. In the case of the largest container used (one of 700 cubic feet capacity) an arrangement of cords and pulleys, culminating in a weight travelling down a notched bar on the ratchet principle, has proved successful; while for smaller containers a row of eyelets round their bottoms and a second row round them at the height of the tray-sides each laced to the trays by strong cording, have solved the problem.

It has been found that the forward motion of the vehicle tends to drive the gas to the rear of the container, so the gas is drawn by the suction of the engine from the back end of these containers. The vertical filling pipe is 2½ in. and the branch to the engine 1 in. A 1 in. cock is alongside the driver's seat from which gas is drawn through a 1 in. flexible metal pipe to the gas and air mixing device which is attached to the air intake of the petrol carburettor. This device is attached to the throttle lever and works in conjunction with the latter, the gas passing in streams through a varying number of $\frac{1}{16}$ in. holes, 48 of these being in action when the throttle is wide open.

With the exception of the rubber containers all the fittings have been designed by the Motor Car Department and manufactured in the company's shops. Cars on the following road motor services are now fitted to run on coal gas:—

PASSENGER SERVICES.—Neath to Pontardawe; Penzance to St. Just; Penzance to Pendeen; Paignton to Totnes; Saltash to Callington; Slough to Farnham; St. Austell to Bugle; St. Austell to St. Dennis; Stroud to Painswick; Redruth to Falmouth; Redruth to Portreath, St. Day, and Carharrack; Uxbridge to Denham; Weymouth to Wyke; Windsor to Ascot; Wolverhampton to Bridgnorth; Wrexham to Farndon.

PARCELS SERVICES.—Cardiff, Manchester, Penzance.

The consumption in the case of 3-ton passenger vehicles generally ranges from 30 to 40 cubic feet per mile, and varies with the quality of the local gas supply.

HOVE OMNIBUS SERVICE.—In reply to a communication from the Corporation of Hove, Messrs. Tilling, Limited, state that they cannot make any reduction in omnibus fares until substantial relief is secured in the cost of fuel, lubricating oil, and spare parts. The company also desire that greater security of tenure should be given them.

HEAVY VEHICLE REPORT.

VIEWS OF THE COUNTY COUNCILS ASSOCIATION.

At a meeting of the County Councils Association the Parliamentary and Highways Committee reported upon the Report of the Departmental Committee on Road Locomotives and Heavy Motor Cars, and submitted the subjoined resolutions:—

(*a*) That the sub-committee are strongly of opinion that the classification of roads should be proceeded with without delay, in view of the fact that the question of road finance cannot be settled until this is done.

(*b*) That the sub-committee approve generally of the recommendations relating to the weight, construction and speed of road locomotives.

(*c*) That the sub-committee strongly object to the proposal to increase the maximum unladen weight of heavy motor cars and trailers.

(*d*) That the unladen weight of a heavy motor car should include everything required to enable it to work upon the road, e.g., accumulators in the case of electric vehicles and water and fuel (including petrol) in other cases.

(*e*) That the unit of 840 lb. per inch width of tire of a 3-ft. diameter wheel used to arrive at the axle-weight permissible for heavy motor cars should be reduced to 616 lb. per inch.

(*f*) That the minimum diameter for wheels of heavy motor cars fitted with iron, steel, or other hard tires should be raised to 3 ft., as it is believed that this size is even at present in very general use.

OMNIBUS SERVICES.

(*g*) That in connection with the recommendation that motor omnibus and similar passenger traffic should be brought under special regulations on the lines of Section 20 of the Local Government (Emergency Provisions) Act, 1916, the sub-committee desire to lay great stress upon the necessity for the Local Government Board to define what is a *bona-fide* "service" as contemplated by that section. The sub-committee also consider that any discontinuance of a service for six consecutive months should operate as a revocation of all rights previously acquired.

(*h*) That motor omnibuses plying for hire elsewhere than within a county borough, should be required to obtain a licence from the Council of any county within which they so ply for hire, such licence to cover the whole area of the administrative county.

(*i*) That with reference to the recommendation that "it should be made an offence to cause or permit the emission of smoke or visible vapour from a locomotive or motor car on a public highway in such quantity as to be a nuisance or danger to the public," the word "annoyance" should be substituted for "nuisance."

(*j*) That, as a general principle, bridges should, where necessary, be sufficiently strengthened to carry the traffic which ordinarily runs on the roads.

(*k*) That a clear statutory definition of "extraordinary traffic" is required.

(*l*) That, with the above exceptions, the sub-committee raise no objections to the recommendations contained in the report.

It was further suggested that inquiry should be made as to when the Government propose to proceed with the promised establishment of a Joint Select Committee of both Houses of Parliament to consider what provisions should be inserted in future local Bills dealing with motor omnibus services and analogous questions, and whether there should be any general legislation dealing with motor omnibus services at large.

In view of the fact that the subject of road traffic generally is to be considered at the forthcoming annual meeting, consideration of the recommendations was deferred.

SUGGESTED CONTROL OF PETROL.

A question was put to the President of the Board of Trade in the House of Commons on March 28 by Mr. Sexton, who asked whether, in view of an attempt to corner petrol supply, this commodity would be controlled under powers similar to those which were to be applied to electricity. Mr. Bridgman, Parliamentary Secretary to the Board of Trade, replied that his attention had been called to a report of the amalgamation of two large companies which dealt in motor spirit. He did not understand, however, that there was a danger of a corner in petrol. The petrol importing companies had been marketing quantities of benzol; but there was no corner in this product, and it was hoped that a large proportion of the output would eventually be distributed by the producers. A scheme for carrying out such distribution was under consideration. In these circumstances the control suggested would not seem to be necessary.

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POST-WAR DEVELOPMENTS OF THE MOTOR OMNIBUS.

By Eric Caudwell, A.M.I.A.E.

At a meeting of the Coventry Graduates' Section of the Institution of Automobile Engineers, on March 4, Mr. Eric Caudwell read a paper on "Post-war Development of the Motor Omnibus," from which the following extracts are taken :—

During the last four and a half years the development of the motor omnibus has been necessarily suspended owing to war conditions, but at the present time it has again become a problem of great importance to automobile engineers. The demand is not confined to London and the large cities, but extends to the rural districts where even in spite of war restrictions there has been a remarkable increase in motor omnibus services linking up villages with towns and railway stations. The era of rural development which has been promised to us as part of the future policy of the Government will certainly call for a great increase in road transport, and for passengers and light goods the omnibus will play an important part.

It is the intention of the author in this paper to discuss the problem of design, indicating what has been lacking in the past and showing the needs of the future. The four-cylinder petrol engine vehicle will be chiefly dealt with, with short references to steam and petrol-electric.

Requirements of a Public Service Vehicle.

First, let us try and obtain a clear idea of the essential requirements of a public service vehicle, and show where it differs from one required for private use. An average mileage for a private car may be taken as 5,000 per annum, for an omnibus as 30,000 or over. To the private owner first cost may well be more important than running cost, while the omnibus owner's profits are dependent on the time he can keep the vehicle on the road, so that it is a sounder policy to pay a high price for a first-class chassis than to have a cheap one that will require more time in dock for repairs and replacements. On the subject of these latter, it may be pointed out that every effort should be made to keep all parts likely to require renewal as simple and cheap as possible, and made to standards giving accurate interchangeability.

To return to the question of operating cost. Taking an average for a 34 passenger vehicle of 10d. per mile, and an annual average mileage of 30,000, a reduction of one penny per mile means £125 per annum, a sum that leaves a handsome additional profit after paying interest on extra capital to purchase a good vehicle rather than a cheap one. It will be readily seen that with large fleets even questions of one-hundredth of a penny per mile become of great importance.

The operating cost question also brings in the matter of weight saving. Provided it is not reduced at the sacrifice of reliability, weight has a very direct influence on running costs. One can safely say that scientific weight reduction is of as great importance to the motor omnibus as to the aeroplane Wind resistance, too, has to be paid for in petrol, and, therefore, hard cash, so that while hardly advocating stream-lining and torpedo bodies, the question is worth the attention of an up-to-date designer. Many small improvements might be made to reduce the wind resistance of present designs, such as side doors for the driver and general smoothing out of the contour.

To the omnibus owner, in his need for low operating costs and consequently increased profits, accessibility and simplicity are among the first requirements. The reliability of the service is dependent on a constant and efficient inspection and supervision, with the possibility of quickly changing any part that is not in a satisfactory condition. If any internal part, such as gear box wheel or differential pinion, cannot be attended to during the few hours per night the vehicle is in the depot, the whole unit must be removed and a new one substituted. The defective unit is then repaired and returned to stores ready for issue to another vehicle.

Having given a summary of the Metropolitan Police requirements regarding the construction of motor omnibuses, the author added that the licensing authority's pre-war requirements aim at securing a lower unladen weight than 3 tons 10 cwt., with a greater passenger carrying capacity within probably the same overall dimensions.

Advantages of Single Deck Design.

Reference to passenger-carrying capacity brings us to the subject of body design, and relative merits of single and double-deck bodies. The double-deck body has never been popular or generally used anywhere outside London, where its development has been favoured by the absence of low bridges, overhanging trees, etc., and the need for moving the maximum number of people as rapidly as possible from place to place. The body question is tied up with the matter of loading and unloading.

The double-deck body is at a serious disadvantage, in that the outside passengers are compelled to pass down a narrow staircase, and the oncoming passengers cannot get up until the others have descended. Further, in bad weather there is always the confusion caused by the scramble for everyone to get inside or *vice versa* on fine days.

It has been found out that it is not a difficult matter to design a single-deck body to seat as many passengers as the present double-deck, viz., 34. This can be accomplished by seating the driver over the engine instead of behind it. With the large single-deck body a wide rear platform can be obtained with large doors and steps to allow two people to pass abreast in opposite directions. This allows the conductor easily to regulate the people, and probably provides the best solution of the body problem. The chassis frame should be extended right back under the platform, which at present is usually hung from the rear of the body. Another point is that the floor of the 'bus should be lower than is at present in use, so that the platform can be mounted by a single step instead of two. To lower the floor means, of course, lowering the whole body with a consequent gain in stability. The single-deck is here at a great advantage over the double-deck. For country services there can be no doubt of the suitability of a single-deck body, on account of its stability, lessened wind resistance, weather protection for all passengers, and safety from overhanging trees, telegraph wires, etc.

Referring again to the question of weight reduction, it should be noted that even more important than a decrease in total weight is a decrease in unsprung weight—that is, wheels and axles. It has been proved that the chief cause of road damage is unsprung weight. The average weight of a 1,000 mm. by 100 mm. solid tyre is 1 cwt., and a present-day cast steel wheel 2 cwt., so that it will be seen that the two back wheels and four tires total 8 cwt., while the complete rear axle scales, roughly, 18 cwt. Allowing 7 cwt. for the complete front axle, this gives a total unsprung weight of 1¼ tons, or half the chassis weight of 2 tons 10 cwt.—a proportion which seems unduly high. This question will be further considered when we deal with axle design.

The metallurgical knowledge gained during the war should be of great use in enabling parts to be lightened by the employment of high-grade material, though it is probably not generally recognised to what an extent alloy steels have been already used. It seems probable that with increased knowledge of welding and light structural work it should be possible to produce an all-metal body of a lower weight than a wooden one, particularly a single-deck with no outside structure, though so little has been done that it is difficult to prophesy.

Design of the Principal Components.

We will now proceed to consider in detail the design of the principal components of the chassis.

Engine.—In selecting the type of engine, we have first to decide between the two extremes—whether it is preferable to use a large slow speed type running at low M.E.P., say, about 750 normal revolutions per minute and 75 lb. M.E.P., or a smaller engine of higher revolutions per minute and M.E.P., say 1,100 revolutions per minute and 90 lb. M.E.P. At present the former type is largely favoured, and has many advantages, such as freedom from carbonisation and consequent long holding of its tune, long wear of working parts, and general reliability. Such an engine, however, is heavy and bulky, and has a lower thermal efficiency than its rival, and this, of course, means a larger petrol consumption for any given work. It may be pointed out that, while a nominal 30 H.P. touring car engine usually runs at about one-sixth of full load, a 'bus engine runs at about one-third, and has far more work to do at full throttle. The need for reducing chassis weight and running cost points to the fact that designers will come to a smaller and more efficient engine of higher compression and M.E.P. With suitable gears, a maximum 8 H.P. of about 35 is sufficient for all ordinary routes. A smaller engine running at a high speed also enables a smaller and lighter gear box to be employed, as for the same road speed a greater reduction can be made in the rear axle.

Concluding, therefore, that the engine of the future will be smaller and lighter for the same power output, we can consider its design in more detail. The six-cylinder engine is, of course, out of the question, as there is nothing to be gained by a multiplication of small parts, and there is no call for refinement. Pair cylinders are desirable on account of ease of handling and lower cost of replacement as compared with a monobloc, and we may expect to see detachable heads to permit of ease of decarbonisation. Valves should all be on one side, operated from a single camshaft placed inside the crank case; the induction pipe may be cast in between each pair of cylinders, passing between them to the other side to a two-branch pipe bolted on. The crank case and all its fittings can follow conventional lines. The most economical system of

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lubrication is troughs fed by a gear pump, with dippers on the connecting rods. For London or cities without really severe gradients, thermo-syphon circulation is sufficient for cooling, but for country work a pump is necessary. In any case, the slight gain in simplicity with the thermo-syphon system is negatived by the extra size of radiator required.

As, in future, electric lighting will be universal, we may expect to see American practice followed, and one dynamo machine used for both lighting and ignition. As there will be no extra complications with starting motors, such a system can be rendered reasonably simple. With an efficient maintenance and inspection service, there is no reason why this should not be entirely successful, but all parts should be really well made. Most battery systems have suffered hitherto from extremely shoddy workmanship. In fact, if the high-tension magneto was as badly made as most car dynamos it would not work at all.

For engine suspension there is no better method than hanging it from two cross members by means of long bolts passing through the crank case. On some American lorries steel-stamped "I" beams are used for these cross members, and they give a better disposition of metal than the more conventional channel section, and there is no need for loose packing pieces where the bolts come.

Clutches.—There is little to be said about clutches except that there is nothing simpler than a well-designed cone type, which has fewer parts and will stand more rough handling than any other. Single and multiple clutches may be very nice for certain applications, but the author does not favour them for really hard service, although the point might be usefully raised during the discussion.

Gear Boxes.—Some of the most interesting problems centre round the gear box, and this may be realised when we consider what is required of it. An ordinary 30 H.P. car does at least 95 per cent. of its mileage on top gear, and hardly ever comes lower than second. An omnibus, on the other hand, is continually changing gear, every stop meaning a complete change up again from first, while the gears are in continual use for all but the most moderate gradients. A count was once made, and showed that a driver in London traffic changed on an average 1,200 times in a day.

Up to the year 1910 many types of spur gear boxes were in use, and all were more or less unsatisfactory, having a very short life, and being so noisy that they were a continual source of trouble with the authorities. Then at one stroke, with the coming of the X type the London General Omnibus Company solved all their problems by the introduction of the silent chain gear box. The power is transmitted by means of wide Coventry silent chains, and the wheels are connected to the shafts by dog clutches. A feature of this box is that the power absorbed by it is practically constant at all loads and speeds, as the chains are always running. On first, second, and third speeds the box takes always practically 1 H.P. This means for normal running on the level about 10 per cent. of the power of the engine, but only 3 per cent. at full throttle on low gear. The disadvantages of the chain box are, briefly, its bulkiness and weight, and consequent cost, also difficulty of obtaining a fourth speed when required without a complicated control.

Regarding the number of speeds, the designer usually has the advantage of knowing the routes his vehicle will be used on. This more exact knowledge of the conditions is helpful to scientific design, and it has been found that three speeds are sufficient for London work, and a fourth is only required for really hilly country districts. During the eight years the chain box has been in use great improvements have taken place in spur boxes. These are principally the universal use of ball and roller bearings, shorter and stiffer shafts, better means of operation, oil toughened gears instead of case hardened, and more accurate methods of making and finishing the same.

Reversion to Spur Type of Gear Box Suggested.

The time has now come to consider whether in the light of modern knowledge we cannot again use a spur type of gear box that will be equally efficient, lighter, cheaper to maintain, and have a longer life than its rival. In the author's opinion one of the chief elements of success with the chain box lies in the use of dog clutches for changing speed instead of clashing teeth into mesh. The Paris omnibuses have long used a spur gear box with all the gears running constantly in mesh and connected to the shafts with dog clutches, and the great possibilities of this type render it worthy of the fullest investigation.

Rear Axle.—Most of the axles at present in use give very satisfactory service, their chief defect being excessive weight, and it is in reducing this we must seek improvement. In the past many types have been tried—spur and bevel double reduction, plain bevel, internal gear drive, chain, and finally worm. The first two were noisy and troublesome, due to insufficient knowledge on the part of their makers. The Milnes-Daimler and De Dion internal gear drive gave a low unsprung weight, as all the mechanism was carried in the gear box, which was connected by short universally jointed shafts to the pinions, which drove the internally toothed rings on the road wheels. Unfortunately, they were incurably noisy, and had a very short life owing to the insuperable difficulty of properly enclosing the final gears.

In spite of its failure in the past, the chain drive has many attractive features. The worm-driven axle, first introduced by Dennis, or Leyland, and now widely used, has been such a great success that many would consider it as the final type, and almost the only thing to be said against it is on the score of weight. Owing to the large reduction in gear ratio and consequent low angle of the worm, heavy thrusts are set up and a very strong cast-steel casing is required to withstand them. With a double reduction axle, having a bevel for the first step and a double helical spur gear for the second, the thrusts are greatly reduced and the loads more distributed, so that an aluminium centre casing might be employed. Recent developments with machine cut spiral bevels and helical gears should render complete silence easy of attainment.

In this country the full floating axle has always found favour, although in America the live axle, with the weight of the vehicle on the driving shaft, is in very successful use. This type is lighter and has fewer parts, though the semi-floating with one bearing on the axle tube is a good compromise.

Regarding torque and radius rods, it has been found that these are quite unnecessary, as for the loads and speeds usual with omnibuses operating on main roads the rear springs can be designed to take all the driving and braking stresses.

Both brakes must be on the rear wheels. A propeller shaft brake is lighter, but it would wreck any transmission, as, owing to the weight on the rear axle, the torque obtained at the moment of wheel skidding is about three times that produced by the engine on first speed.

Road Wheels.—These have always been among the most troublesome parts of a chassis, and a finally satisfactory type has yet to be evolved. Wheels made from steel sheets pressed into shape and welded or rivetted together have been extensively employed, and it appears that such a construction may be the final type, allowing as it does the use of a reliable and homogeneous material that can be disposed in the most suitable sections to withstand the strains imposed on it. One of the most obvious ways of reducing the weight of wheels and tires is to decrease their diameter, which also has the advantage of lowering the body and centre of gravity, but we are met with the objection that the smaller the wheel the less easily does it pass over an obstacle. If, however, the unsprung weight is reduced and the vehicle springing improved, this disadvantage may be more than neutralised. The present standard tire is 40 in. by 4 in., and this could well be reduced to 36 in. by 4 in.

Frames.—Chassis frames were always a source of trouble up to the introduction of the De Dion ash and steel flitch plate construction, which from the first has always been reliable and satisfactory, although it is heavier than a steel channel of the same strength. The constant quest for improvement will, however, probably cause its disappearance in favour of a girder frame on Austin lines, or the very deep channel first introduced on American touring cars. We can see now that, as in the case of the spur gear box, the early troubles with steel frames did not arise from any inherent defect, but rather from lack of knowledge on the part of their constructors and users. The wooden frame is only a compromise, and will have to give place to a more scientific construction. Flitch plate frame for 3-ton lorry with 14 ft. 2 in. wheel base, 8 cwt. 0 qr. 14 lb.; pressed steel frame for same lorry, 7 cwt. 2 qr.; flitch plate frame for omnibus, 14 ft. wheel base, 6 cwt. 0 qr. 17 lb.; pressed steel frame for omnibus 11 ft. wheel base, 4 cwt. 1 qr. 14 lb.; flitch plate frame for omnibus 12 ft. 10½ in. wheel base, 5 cwt. 1 qr. 10 lb.

Springing.—Commercial vehicle springing is always a matter of difficulty on account of the large variations in load that have to be allowed for. In the case of an omnibus from zero up to two tons, present-day springs are all too stiff, and result in a high percentage of breakages. Many ingenious alternatives to the conventional leaf spring have been proposed and some tried, but until we get an entirely new system great improvements may be effected by the use of much lighter springs, in conjunction with a shock absorber that will stiffen up as the load increases.

The author next gave particulars of the London General "B" type omnibus. In concluding he said there were three alternatives to the type of vehicle with which he had been dealing, the electric battery vehicle, petrol electric, and steam. The first-mentioned may have a field of usefulness for short distance routes on fairly flat roads. The other two systems are exemplified by the productions of one manufacturer of each—Messrs. Tilling-Stevens and National Steam Car respectively.

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L.G.O.C. EFFICIENCY MEETINGS.

The sixth meeting of the fourth series of efficiency meetings of the Operating Department of the London Underground Railway and the London General Omnibus Company, Limited, was held on Tuesday evening, March 25, at the Cinema Hall, L.G.O.C. Training School, Milman's Street, Chelsea. Mr. H. E. Blain (the operating manager) presided over a crowded meeting. among those present being Mr. J. B. Thomas (general superintendent L.G.O.), Mr. G. P. Main (Board of Trade), Mr. C. J. Spencer (manager of the L.U. and M.E. Tramways), Mr. J. B. Mackinnon, Mr. Murray Griffith (District Railway), Mr. Hayward (surveyor, Battersea), Mr. W. Murray (Walthamstow Tramways), Mr. Percy Bulnois (London Safety First Council), Mr. Duke (Tilling's), Mr. Willis (surveyor, Chiswick U.D.C.). Mr. A. Winter-Gray (operating manager's department) read a paper on "Safety First—the Progress and Possibilities of Accident Prevention Work," and this was illustrated with a long series of cinematograph films and lantern slides, which greatly interested and amused the company by their humour and direct bearing on their everyday work. The paper dealt first with American methods of accident prevention and the "Safety First" organisations spread throughout the United States. Next Mr. Winter-Gray dealt with the British methods and efforts in the same direction. He held a brief for the London "Safety First" campaign, and carried the meeting with him in his undoubted claims for beneficial and profitable (from all points of view) results of "safety work." An interesting discussion followed, the Chairman, Mr. J. B. Mackinnon, Mr. A. Hutson (Claims Department), Mr. R. Johnson (Claims Assistant, L.U.R.), Mr. Murray, Drivers Rolls, Salmon, and Howells took part.

The Chairman said he thought this "Safety First" campaign was one of those things of which they might be justly proud. So far as London was concerned, the work had been a magnificent success, in fact, a greater success than when they started he thought could ever be achieved. The movement had attained a very definite objective in all their minds.

Mr. J. B. Mackinnon (general traffic superintendent, London and Suburban Company's group of tramways), in opening the discussion, said that Mr. Gray's paper was a very liberal education in the progress and possibilities of accident prevention work. There were two points of view in this campaign, viz., the humanitarian and the materialistic. On the first, it was not possible to usefully add anything to what Mr. Gray had already said, but as to the second he was convinced there would be a reduction in the number of preventable accidents. His tramways had never launched out in the campaign as the L.G.O.C. had done, but he was convinced the tramways had benefitted very materially from that work. Their accidents had been showing a decrease, and this year the figures were approximately 30 per cent. less. He thought the London Press had not done as much as it might in giving publicity to the campaign—certainly not as much as the Press in America, but perhaps they had been occupied with more important matters during the last two or three years. The London Safety First Council was to be congratulated on its work, especially as it had been done under war conditions. He thought every operating official would agree with the suggested Safety First Committees composed of officials and employees, but he joined issue on the suggestion that such committees should investigate accidents and give a verdict. Personally he would not like to be a member of such a committee to pass judgment upon a colleague, and employees were in the same position. Staffs would not like to be associated with disciplinary measures, otherwise such committees would be very useful, though he also differed on the suggestion that they should keep records, because this would mean the duplicating of the work of a responsible department.

Mr. A. Hutson (assistant divisional inspector L.G.O.C.) suggested that route maps should be issued to drivers, giving details of turnings, crossings, road repairs, etc. This would facilitate safe driving. He was of opinion that in transport undertakings sufficient work could be found for a "safety first official," or even a number of experts of that character. He was not in favour of recognised stopping places for omnibuses, because greater revenue was obtained under present conditions from short distance riders, while between the stops encouragement would be given to speeding-up; thus the object of safety first would be defeated. He urged that a substantial reward should be offered for an accepted design of a front wheel guard. Those shown that evening appeared to be rather crude. He also suggested an improvement in street signs to drivers. They should be much more "arresting," for at present they conveyed little, and he indicated how they could be improved to warn the driver as to curves, crossings, etc., which would all tend to promote safety on the roads.

Mr. R. Johnston (claims assistant, U.R. and L. and S. Traction Company) dealt with the early efforts in regard to the Safety First campaign, and asked if they had profited by the propaganda and their experience during the last three years. He thought they could all agree that great developments had taken place, and that not only the companies but also the public had profited very considerably. He did not know why tramway statistics had been omitted from the paper, because tramways had benefitted considerably. Indeed, in his own case, they seemed to have reached the high-water mark of efficiency. They had made considerable progress on the tramway side. He dealt particularly with the design of the Underground Railway by Mr. Cooper, and pointed out how it had successfully withstood claims in the courts on the point of construction. He believed there was a great future for the campaign industrially. Figures showed that even now the compensation worked out at some 5 per cent. as against 25 per cent. or 40 per cent. according to the nature of the work. This was on the railway side, whereas the figures on the tramway side were nearly as good. This aspect of affairs ought to be gratifying to the management. He agreed with Mr. Mackinnon that some of the suggestions in the paper were not practicable, and especially that the Safety First Committee of officials and employees should deal with serious accidents. When men got round a table they would not be willing to blame a fellow officer.

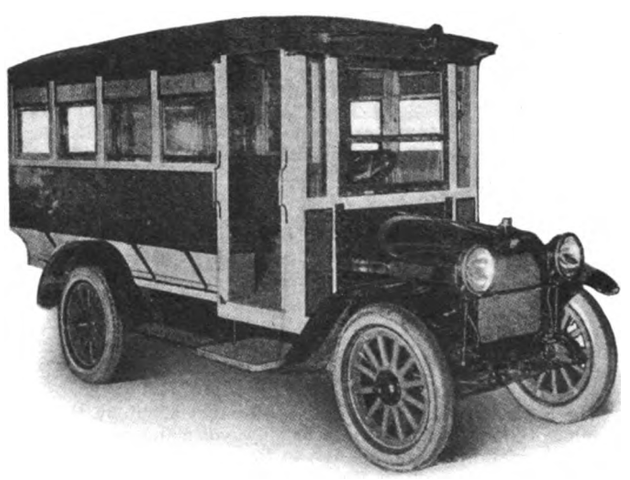
Mr. Rolls, a driver, suggested there were practically "stops" already for omnibuses, and in the suburbs he believed compulsory stops would answer very well.

Mr. Salmon (driver) said he was the man referred to who got the medal, but he was awarded it for two years' service, during three months of which he had been ill. He had been driving since 1908 and had never had an accident.

Mr. Howell having spoken, a cordial vote of thanks was passed to Mr. Winter-Gray for his address, and to Mr. Blain for presiding, proposed by Mr. Murray (Walthamstow), seconded by Mr. A. Gowans Whyte.

CLOSED CABS FOR OMNIBUSES.

In addition to the omnibus of the pay-as-you-enter type shown at an industrial motor vehicle exhibition in New York, and illustrated below, there were numerous other omnibuses exhibited in which closed cabs were a feature. Similar prominence was given to the closed cab body at a recent exhibition at Chicago. The closed cab is intended for winter driving, and it was to be seen in many different types. Some are designed so as to be removed in summer, and in these a new type of light top is fitted. It is



Pay-as-You-Enter Omnibus Exhibited in New York.

held that a closed cab enables a driver to do more and better work. The New York *Commercial Vehicle* affirms that the innovation is a war lesson. In France the drivers of American trucks were supplied with the best quality of rubber coats and rubber curtains hung in front of the cab to keep them dry and fairly warm. It is asserted that many of the men returning to the States will be dissatisfied in operating trucks unless they are provided with at least as good or better protection as they had while abroad.

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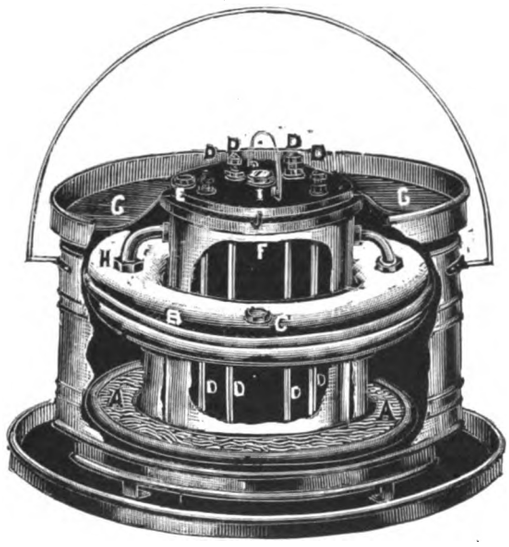
MOTOR TRAFFIC

GABRIEL'S STEAM SPRAYER.

A Useful Disinfector for Public Vehicles.

The steam sprayer illustrated below, which is designed for disinfecting purposes, has been found specially suitable for use in tramway cars, omnibuses, and other public vehicles which, owing to being overcrowded at the present time, are great germ carriers, and should be disinfected once every day. The mode of disinfecting the cars is by placing the sprayer inside the car and closing all the doors and ventilators, or by placing the sprayer on the platform and attaching to one of the spraying tubes the flexible tube with nozzle, which is run through the keyhole or any other aperture into the car. The remaining three spraying tubes are fitted with blank caps.

The arrangement consists of a portable stand of wrought steel, in the centre of which is placed a round metal burner, A, filled with asbestos wool, and arranged to burn methylated spirit. Suspended over the burner is a round copper boiler or water jacket, B, in which



Gabriel's Steam Sprayer.

is placed the water to generate the steam. In the centre of this boiler is placed a metal vessel, F, in which is placed the liquid to be sprayed, and this vessel is connected to the boiler by a bent metal tube. Attached to the top of the vessel, and extending to the bottom, are placed metal tubes, D, and at the top of each is fixed a valve, I, with an adjustable cover to regulate the pressure. The valve has four very fine holes drilled in the bottom, and a single hole in the centre of each cap through which the steam and liquid are passed. The fitting is provided with a suitable spring safety valve, which allows any surplus steam to escape. When the steam is generated in the outer boiler, it passes through a tube into the centre boiler containing the fluid to be sprayed, and then up the four small holes in the valve chamber, and draws up the fluid and passes the same into the atmosphere in the form of a very fine spray. The sprayer is made in three sizes, and is manufactured by Messrs. Gabriel and Company, of 4 and 5, A.B. Row, Birmingham.

RAIL AND OMNIBUS FARE REVISIONS.

The increase in operating expenses brought about by the introduction of shorter working hours for railwaymen and certain sections of transport workers, in addition to the constantly increasing cost of materials necessary for maintenance, has entailed a revision of fares on the Underground Railways and London General Omnibuses. Certain changes took effect on March 27th. On April 6th certain fares on the District, Bakerloo, Piccadilly, Hampstead, Central London, and City and South London Railways were revised, and a revision in certain season ticket rates on all the Tube Railways will take place also at a later date.

Thames Valley Omnibus Service.—The British Automobile Traction Company have been granted licences for motor omnibuses to run from Reading to Henley and Marlow.

LEYTON'S ELECTRIC DUST VAN.

Seven Further Purchases Recommended.

In a report on the working, for the year 1918, of an electrically-propelled motor dust van, the Leyton Urban Council surveyor expresses the opinion that results had been even more satisfactory than for the half-year ended December 31, 1917, and fully justified the purchase of sufficient motor vans to collect the whole of the house refuse of the district. The average number of contractors' horse vehicles last year was 14 carts per day, and the saving of three carts per day by the use of motor vans was maintained throughout the year.

On the basis that the motor van is carrying out the work of three carts, the comparative cost is as follows:—

	£	s.	d.
Three days at £1 3s. 8d. per day	£3	11	0
One filler's wages	0	9	7
Cost per day for horse carts	£4	0	7

307 days at £4 0s. 7d. equals £1,236 19s. 1d.

The cost per day for motor vehicle for 12 months ending December 31, 1918, has worked out as follows:—

	£	s.	d.
Driver (including overtime)	£0	12	8½
Two fillers (ditto)	0	19	1½
Electric current	0	4	0
Maintenance and repairs	0	4	0
Contingencies, say	0	1	0
	£2	0	10
Less receipts	0	5	0
	£1	15	10

307 days at £1 15s. 10d. equals £550.

	£	s.	d.
Annual cost of three horse carts	£1,236	19	1
Annual cost of one motor van	550	0	0
	£686	19	1
Less 12 per cent. depreciation (or repayment of loan), say	169	19	1
	£517	0	0

The motor van is collecting house refuse from 13 miles of roads, or one-fifth of the total mileage, and from 4,000 houses, or one-sixth of the whole.

These figures, the surveyor states, bear out his previous report that seven vans should be provided to do the whole of the work of the district. Although the cost should be little more than that of six vans in full work without breakdown, for the sake of comparison it may be assumed seven vans with working expenses, including seven drivers and twelve fillers, together with maintenance and repairs amounting to £3,550, plus depreciation or repayment of capital spread over ten years, of say £1,180, against 16·8 horse-drawn carts at 23s. 8d. per day, and five additional fillers, or £6,840 per annum, with one motor van and driver in reserve for breakdown or emergencies or assistance with other work.

RUNNING COSTS OF A CAR.

An official of Southampton Corporation was furnished with a motor car in lieu of a horse and trap in June, 1913, at a cost of £267 12s. For the first two and a half years the running cost per mile, including petrol, lubricating oil, tires, repairs, and all other incidentals, including insurance, but excluding any sum for depreciation, varied from 2·36d. to 2·51d. The figures for 1916, 1917, and 1918 are given below.

	Miles Travelled.	Cost of Running.	Insurance.	Repairs and Hire.	Total.	Cost per Mile.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	d.
1916	5,155	37 7 3	12 7 6	4 12 9	54 7 6	2·53
1917	5,399	32 10 0	12 7 6	5 12 6	50 10 0	2·24
1918	4,501	37 5 6	12 7 6	37 13 6	87 6 6	4·65
Total for 3 years to Dec. 31, 1918	15,055	£107 2 9	£37 2 6	£47 18 9	£192 4 0	3·06

The large sum for hiring in 1918 was due to the length of time taken in getting a broken part replaced.

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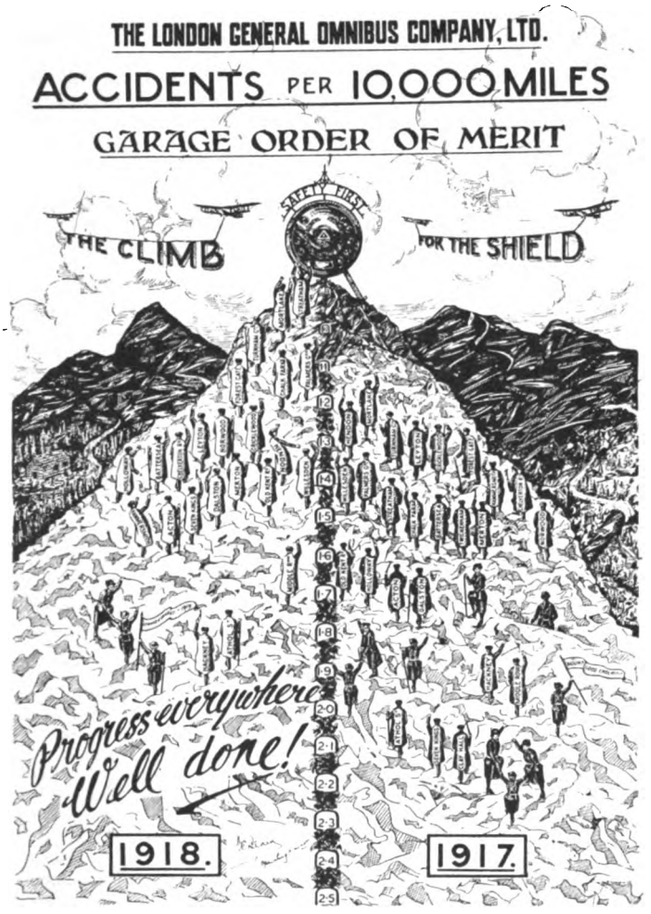
MOTOR TRAFFIC

FREEDOM FROM ACCIDENT SHIELD.

To stimulate their staff to greater efforts in the direction of freedom from accidents, it is the practice of the London General Omnibus Company to award a shield each year to the garage whose drivers have had the fewest number of accidents per 10,000 miles



run. For the year 1918, although closely contested by Mortlake and Turnham Green, the shield has been won by Streatham. The continued improvement in the direction of safety by all garages will be apparent when a comparison of the 1918 figures against each garage is made with the corresponding figures for 1917, as shown in the appended cartoon.

ROAD BOARD OFFICERS.

Mr. Manville, in the House of Commons, asked the Prime Minister whether Sir George Gibb, previously general manager of the North Eastern Railway Company, has resigned the chairmanship of the Road Board in order to return to the service of that company, and whether it was the intention of the Government to appoint to the chairmanship of the Board someone who had practical knowledge of the problems of roads and road traffic. Mr. Baldwin, in reply, said that Sir George Gibb was continuing to act as chairman of the Road Board until a permanent arrangement could be decided upon as a result of the consideration by Parliament of the Bill for the establishment of the Ministry of Ways and Communications.

It was stated in the House of Commons subsequently that Brigadier-General Maybury, who has been acting as Director of Roads in France under the War Office, resumed his duties as engineer and Secretary of the Road Board on February 27. Subject to the approval of the Board and of the Treasury where necessary, General Maybury has full authority to assist local authorities to carry out the programme of road and bridge work approved by the War Cabinet.

MOTOR VEHICLES FOR MUNICIPALITIES.

LUTON COUNCIL contemplate obtaining an ambulance.

BOLTON CORPORATION have purchased a motor wagon with tipping body.

HALIFAX TRAMWAY COMMITTEE propose to obtain a motor tower wagon.

HARROGATE COUNCIL are acquiring an Austin lorry at an estimated cost of £865.

TUNBRIDGE WELLS COUNCIL have agreed to purchase two motor lorries for refuse collection.

PETERHEAD COUNCIL have been presented with an ambulance by the Aberdeen Red Cross Society.

WALTHAMSTOW COUNCIL have received delivery of a steam wagon from Messrs. Clayton and Shuttleworth.

JOHANNESBURG MUNICIPAL COUNCIL have purchased a 25-H.P. "Reo" four-cylinder ambulance for £615.

LEYTON URBAN COUNCIL have decided that not more than three War Office motor vehicles shall be acquired.

KNARESBOROUGH RURAL COUNCIL have appointed a committee to go into the question of mechanical haulage.

WINCHCOMBE RURAL COUNCIL have asked a committee to report on the question of obtaining a steam tractor and trucks.

LONDONDERRY CORPORATION have ordered six single-deck motor omnibuses from the Associated Equipment Company, Ltd.

LEAMINGTON COUNCIL have authorised the surveyor to purchase motor vehicles or horses as he deems fit, to the value of £1,000.

PERSHORE COUNCIL are considering the respective claims of petrol and steam wagons for service in their rural district. Reports have been called for.

PLYMOUTH CORPORATION are to receive a recommendation from a sub-committee of the Hospital Committee with regard to purchasing a steam wagon.

THE SWANSEA HEALTH COMMITTEE have decided to provide the superintendent and four foremen with motor bicycles, so that they can more effectively supervise scavenging work.

HESTON AND ISLEWORTH COUNCIL have placed orders as follows:—Five-ton Sentinel tipping wagon, £1,295; 3-ton Mann's tipping wagon, £985; and one 5-ton Clayton tipping wagon, £1,105.

LEWISHAM GUARDIANS are inquiring as to the purchase of a motor ambulance. They were offered a special constabulary ambulance for £350, but concluded it would be advisable to purchase a new vehicle.

ROMFORD RURAL COUNCIL have purchased a 3½-ton Straker-Squire motor lorry for £550, which the chairman of the Highways Committee and the surveyor selected on a visit to Richborough, the train ferry port.

PORTSMOUTH CORPORATION have obtained a reduction from £1,377 to £1,277 in the price of a rubber-tired steam tipping wagon, to be purchased from Messrs. Foden, Limited. In November, 1916, Messrs. Foden's tender was £800.

NEWTON URBAN COUNCIL, after considering their surveyor's report of his inspection of the motor vehicles belonging to Warrington, have decided to defer the question of purchasing motors until the Government release some of their war stock.

THE CENTRAL GARAGE COMMITTEE of Glasgow Corporation suggest acceptance of the offer of Messrs. Claud Hamilton, Limited, to supply three Crossley cars, 20-25 H.P., and three Swift cars, 17 H.P., delivery to be completed by the end of June.

STEAM LORRIES FOR ROAD WORK.

INQUIRIES BY MINISTRY OF MUNITIONS.

Reporting to Warwickshire County Council, the surveyor states that in view of the increasing difficulty of getting road material hauled, and of the great increase of price for all team work, it is advisable to acquire a number of motor lorries. The average cost for the delivery of the material on the roads for the twenty years from 1894-1914 was 8d. per ton per mile. Since the commencement of the war the average price has been as follows:—1915, 9·2d.; 1916, 10·6d.; 1917, 13·1d.; 1918, 16·2d. The Road Board had been requested by the Ministry of Munitions to ascertain what plant is likely to be required by local authorities to carry out the road programme for 1919-20. He recommends that applications be made for ten steam rubber-tired lorries to carry four tons each, and that a similar number of trailing wagons be also acquired.

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MOTOR TRAFFIC

MOTOR TRAFFIC NOTES.

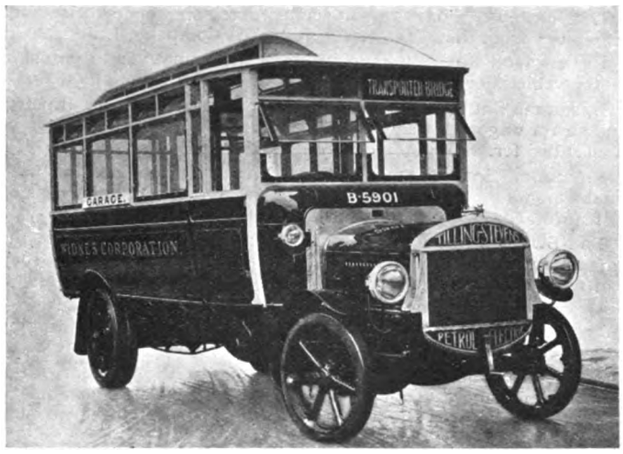
PETROL FOR LIVERPOOL OMNIBUSES.—Liverpool Corporation Tramways Committee have placed an order for a twenty-thousand gallon petrol installation on the hydraulic system.

OMNIBUS SERVICE FOR A VILLAGE.—Amersham Rural Council have given permission to Messrs. Miles and Company to run a motor omnibus between Amersham, Chesham, and Wycombe.

BIRMINGHAM-WORCESTER OMNIBUS FACILITIES.—With the situation as regards labour and materials becoming easier, the omnibus service between Birmingham and Worcester has been increased to a half hourly one.

ALCOHOL FUEL INVESTIGATION.—Under the auspices of the Royal A.C and the Commercial Motor Users' Association, a programme of research is to be conducted at Manchester University into the behaviour of the vapour of alcohol and mixtures of alcohol with benzol and petrol, etc.

OMNIBUSES IN MELBOURNE.—Sanction has been given to a Sydney firm for running a service of motor omnibuses in Melbourne. The three vehicles already in service were driven from Sydney to Melbourne, a distance of 580 miles, and ten more are to be added. The omnibuses, which are of the single-deck type, are of American manufacture.



Tilling-Stevens Single-Deck Omnibus for Widnes Corporation.

PETROL FOR MOTOR SWEEPERS.—To simplify the procedure entailed in applying to the Customs and Excise for the repayment of one-half of the duty charged for petrol used in the sweeping machine belonging to Islington Borough Council, the department suggest that the Mayor and two other members should enter into a bond to ensure the proper use of the spirit.

TARLAND-ABOYNE MOTOR SERVICE.—A motor service for goods and passengers between Tarland and the Howe of Cromar is projected. At a public meeting it was decided to ask the East of Scotland Public House Trust, Limited, the present mail carriers, to commence a motor service. A committee was also appointed to take steps to secure a motor service between Aboyne and Tarland.

THE SUPER-TAX ON MOTOR SPIRIT.—In reply to representations by the Automobile Association in regard to the war super-tax on motor spirit, the Secretary of the Treasury states that their lordships have no power to waive the statutory requirements of the Finance Act, 1916, and that they are unable to deal with the matter in advance of the general consideration of the Budget requirements of the year.

NOTTS COUNTY COUNCIL AND RURAL TRANSPORT.—A special committee of the Notts County Council, after considering the subject of rural development, have expressed the hope that it will be found possible to continue the road transport organisation through the local authorities after the war, and that liberal grants should be made out of the National Exchequer for the reconstruction and strengthening of highways.

PROCEEDS OF THE WAR TAX ON PETROL.—Up to February last the motor spirit licence duty had brought in £71,859 to the Petrol Control Department. The staff in the employ of the department numbered 438 persons, whose salaries amounted to £3,993, but on March 14 the staff had been reduced to 382. The Royal A.C. intend to make an effort to secure the removal of the tax of 6d. per gallon when the new Budget is introduced.

RUBBER PAVING FOR ROADWAYS.—At the suggestion of Rubber Roadways, Limited, Mr. A. Harrison, borough engineer of Southwark, has obtained sanction from the council to continue an experiment of rubber paving for roadways, which was tried on a small scale a few years ago. An area of 400 square yards is to be paved with patent rubber blocks made from a composition similar to that used for solid-tired motor vehicles.

SUITABLE ROADS FOR OMNIBUSES.—A sub-committee of Wakefield Corporation have interviewed the general manager of the Yorkshire (West Riding) Electric Tramways Company with regard to providing either a tramway or omnibus service to Alverthorpe and Flanshaw. The committee reported that the present cost of construction rendered tramways prohibitive. If the roads could be made suitable the company would run omnibuses at their own risk.

AUCTION SALES OF SERVICE VEHICLES.—Under the auspices of the Disposal Board of the Ministry of Munitions, a large number of army motor cars and lorries were sold by auction during March in the Gilbey Hall of the Agricultural Hall, London. Full opportunity was afforded to obtain vehicles in single lots, and good prices were realised. Sales are to be held in various districts. Mr. W. Wolsey, jun., has been added to the Advisory Committee to the Disposal Board.

LANCASHIRE COUNTY COUNCIL'S TERMS FOR OMNIBUSES.—A payment of 2d. per omnibus mile on main roads, and an initial fee of a guinea per annum for each vehicle, are the terms upon which the Lancashire County Council have offered to sanction a motor omnibus service proposed by Mr. R. Roberts, of Widnes. The Council propose that these terms shall stand for five years, and they make the offer "in accordance with the provisions of the Local Government (Emergency Provisions) Act."

MESSRS. TILLING-STEVENS, in common with manufacturers possessing well-equipped works, were engaged almost entirely upon Government ordnance work. Since the cessation of hostilities however, they have made a rapid change over to automobile construction, and, being fortunately in possession of a fair stock of raw materials, are now able to concentrate upon the reduction of their waiting list. The illustration on this page shows a recent delivery of a single-deck omnibus, which is one of a number supplied to the Widnes Corporation. The chassis is the Tilling-Stevens standard 3-4 ton petrol-electric machine.

FRENCH CABS FOR LONDON.—The Home Secretary, replying to a question in the House of Commons, said that the present shortage of taxi-cabs was due to the scarcity of material and labour. As material became available, more and more cabs would be overhauled and put in service, but the question of licensing other types approximately suitable was under consideration. Sir P. Goff, having observed that several French firms were ready and willing to supply vehicles at once as soon as the Government prohibition was lifted and the duty taken off, Mr. Shortt said it was a question whether such vehicles were fit for the traffic of the London streets.

OMNIBUSES FOR EDINBURGH.—In his report to Edinburgh Tramways Committee, recommending the electrification of the cable tramways, Mr. R. Stuart Pilcher, general manager, urged that "it was desirable for the city to obtain powers to operate motor omnibuses in conjunction with the tramway system outside the city boundaries. There will be a distinct scope and promising field for the operation of motor vehicles. In addition to the temporary services over proposed extensions of the tramways, motor omnibuses would be useful to supplement the existing services at certain points; they would also be useful in cases of breakdown of portions of the cable system and for special purposes." The Corporation have since decided to purchase 15 omnibuses.

RUBBER FOR CHEAP MAINTENANCE.

Messrs. Leyland Motors (1914), Limited, have informed Westminster City Council that they find difficulty in obtaining steel tires for the front wheels of the Council's wagons on account of the general adoption of rubber tires, and offer to provide suitable front axles and wheels for the reception of rubber tires for four wagons which are maintained by them, the Council providing the rubber tires. The effect of rubber tires will be, the company state, to reduce the wear and tear of the motors, and consequently to reduce the work of maintenance under the contract. Moreover, when the contract was extended for a year recently the maintenance charge was increased from £55 to £100 per wagon per annum. In these circumstances the Works Committee have informed Messrs. Leyland Motors that they would recommend acceptance of their offer if they would provide the first sets of rubber tires as well as the axles and wheels. This the company have agreed to do, and the tires will be, it is understood, of the Shrewsbury and Challiner make.

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THE
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SATURDAY, APRIL 12, 1919.

UNIFICATION OF TRAMWAY SERVICES.

IN the Standing Committee, dealing with the Ways and Communications Bill, Sir Eric Geddes, last Tuesday, moved an amendment, including all tramways, excepting municipal undertakings, under the control of the proposed Ministry. Mr. Joynson-Hicks twitted the Government on the proposal, and asked if they were afraid of the municipalities. A serious point, however, was raised in the resumed discussion on Wednesday by Mr. Renwick, who pointed out that great inconvenience was caused by tramway authorities adopting different gauges, and suggested that municipalities which refused running powers over their lines to adjoining authorities should be compelled to grant such running powers. Sir William Pearce urged that some provision, short of taking possession, should be devised for the control of municipal tramways. Municipal authorities have constantly complained, and, in our opinion, rightly, against the obstructions placed in the way of tramway development, but it is a singular proof of the fallibility of human nature when put to the test by the possession of power, that municipalities themselves have been guilty of obstruction. We need not cite examples, because most cases, when examined in detail, admit of argument on both sides. Most of our readers, however, will easily call to mind instances in which local jealousies have operated to the serious detriment of the public service. In a matter of this sort, moreover, it is not the particular examples that have to be considered, but the broad principle involved. At last, after long years of parochial thinking, we are arriving at the ideal of national service. With the growth of population, and under the tremendous impulse of war activity, local boundaries have been obliterated. District is linked to district, town to town, city to city, in the bonds of a common activity. The facilities of communication must be adjusted to this great fact. Of all public services, tramways are the most deeply involved in the overflow of local boundaries, for they serve most intimately the needs of the populace. Workers will engage in employment six or even twelve miles away from their homes, if a tramway service will take them to and from their place of work. The mobility of labour is an urgent national necessity, and if a change of employment involves the removal of the workman's family, it places a strong barrier against the free flow of labour supply to where it is in demand. In most industrial districts tramway services of one kind or another exist. That is to say, the tramways are there; but if the district is divided up into several townships, or local authorities, each having its own isolated system of tramways, the value of the tramway services is largely reduced. In such a definitely concrete matter, it will not do to argue in the abstract, but there is no injustice in insisting that, for the future at least, all the tramway systems of the country should be standardised in gauge of track and as many other details as possible, so that running powers may be exchanged with facility. Unluckily there is more involved in the idea than the general public can well believe, and only the force of public opinion backing a strong Government Department could be relied upon to achieve the end desired. We trust, therefore, that Mr. Shortt's offer on behalf of the Government to accept an amendment to the Ways and Communications Bill giving the Ministry the right to enforce connection between adjoining systems and the exchange of running powers will be accepted and the provision inserted in the Bill.

GLASGOW TRAMWAY FARES.

MANAGER ADVOCATES THE ABOLITION OF HALFPENNY FARES.

Mr. James Dalrymple, general manager of Glasgow Corporation Tramways, in an address to the Rotary Club at Glasgow on Tuesday, urged the necessity for increased revenue from the tramways and the abolition of the halfpenny fare. He said capital expenditure amounting to £3,862,000 had been paid back to the public, and the undertaking to-day stood entirely free of debt. An important question was, should the users of the tramways pay to the Corporation, who were owners, anything in the shape of interest for the use of that money. If the Corporation received 5 per cent., that would enable them to hand back to the proprietor, the Common Good, a sum of £200,000 annually. Last year the balance was only £177,000—less than 5 per cent. on the capital expenditure. Had there been any interest to pay or sinking fund charge to meet, the undertaking would have been practically bankrupt. He said unhesitatingly, that an increase in fares was absolutely necessary. The wages bill, which in 1913 amounted to £412,000, would this year, it was estimated, be £850,000, and in 1920 about £955,000. Their great difficulty was the enormous number of passengers carried at a halfpenny. If they kept the halfpenny fare for a half-mile stage, they would only aggravate the congestion on the cars. He thought the halfpenny passenger should give place to the penny passenger, and that a penny should be the minimum fare.

NEWCASTLE TRAMWAYS AND THE RATES.

A CLEAR POLICY—PROPOSED RENT CHARGE.

Councillor R. Mayne, Chairman of the Newcastle Tramways Committee, recently presented an interesting report to the City Council on the position of the tramways with regard to the relief of rates. A year ago, after contributing £14,000 to the rates, and carrying the rest of the balance to the reserve fund, that fund amounted to £155,000. During the year just concluded there was a tremendous increase both in revenue and in cost. He submitted the following comparison:—

	YEAR BEFORE THE WAR.	LAST YEAR.
Passengers	65,000,000	101,000,000
Receipts	1s. per car mile	1s. 6d. per car mile.
Costs	3·22d. ,, ,,	6·62d. ,, ,,

The cost has increased 100 per cent., and the receipts have increased 50 per cent. There would be a profit on the year's working of £45,000, but their estimates for the next year showed a profit of only £700, and the sum drawn from the reserve fund would be £55,000. Every year, Mr. Mayne said, there was haggling about how much ought to be taken from the tramways to the relief of rates. It was time they arrived at a clear policy. Half the capital of the tramways had been repaid, and £70,000 was being paid annually in redemption. There was a reasonable feeling that the present generation should have some greater advantage. The Tramways Committee were prepared to meet a rent charge of £14,000 per annum as their contribution to the rates. Any advantage beyond this

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should be by way of improving the conditions under which people travelled. Newcastle was one of the few towns where fares had not been raised. They might have to face the prospect of a revision, but he hoped they would get through without an increase. The Council decided to accept the Committee's proposed contribution, which would relieve the rates to the extent of 2d. in the £.

TRANSPORT BILL IN COMMITTEE.

ELECTRIC SUPPLY DEFERRED—MUNICIPAL TRAMWAYS EXCLUDED.

On Tuesday, April 8, Standing Committee B of the House of Commons resumed discussion on an amendment moved to Clause 2, by Mr. Joseph Johnstone, to leave out paragraph (g) which relates to the transfer to the new Ministry of the powers in reference to the supply of electricity.

Mr. Shortt, on behalf of the Government, stated that, when the Bill was drafted, they hoped that the Electricity Bill, to be brought in by the President of the Board of Trade, would have been passed into law, and they included transfer of all the powers connected with electricity to the new Ministry on the assumption that the question of electricity supply had been settled. Owing to the illness of the President of the Board of Trade, however, this had been impossible. The Government were as convinced as ever that the control of electricity should be in the hands of the Department of Ways and Communications, but they accepted the amendment on the ground that it would be better to deal with the whole question when the Electricity Bill was introduced.

Mr. Joynson-Hicks moved an amendment deleting from Clause 2 words conferring upon the new Minister powers to transfer any powers of any Government department, with respect to the appointment of members, or the procedure, of the Railway and Canal Commission, or of any Commissioners, Conservancy Boards, or other body. Mr. Shortt said that the Government proposed to add words providing that "Nothing in the section shall transfer to the Minister the powers of the Board of Trade in respect to the appointment of members, or the procedure, of the Railway and Canal Commissioners, but His Majesty in Council may by Order of Council transfer these powers to the Secretary of State instead of to the Ministry." With this addition, the amendment was agreed to.

Mr. J. D. Gilbert moved an amendment to Clause 2, the effect of which was to provide for the transfer to the new Ministry any powers of any Government department with respect to the bye-laws, regulations, orders, licences, approvals, or consents, relating to any matters mentioned in the Clause. He said that they thought in London that if they were to have one transport authority, and that transport authority was going to deal with tramways, it ought also to deal with motor omnibuses. The amendment was carried on a division by 17 votes to 19.

An amendment was moved by Mr. Joynson-Hicks, to provide that all matters relating to roads, bridges, and ferries, and vehicles and traffic thereon, should stand referred to the Road Board, as reconstituted by the Act. On behalf of the Government it was pointed out that if the amendment meant that the general policy was to be blocked by the Road Board, it was impossible, but if it simply meant that a body of skilled persons should advise the Minister, when required, that was already met by the Ministry's Department for Roads. The amendment was rejected.

Sir Eric Geddes moved an amendment to delete the word "tramway" from the Clause, and to insert words giving power to take possession of a tramway, other than a tramway, or light railway used as a tramway, belonging to a local authority. Mr. Joynson-Hicks asked if the Government were afraid of the municipalities. Sir Eric Geddes said that tramways were valuable undertakings belonging to the communities directly, and it was thought that they should be excluded from the scope of the Bill.

Discussion of Sir Eric Geddes's amendment was resumed on Wednesday, April 9. Mr. Renwick expressed the hope that, if the new Ministry obtained control of tramways, care would be taken that all tramways should have the same gauge. Great inconvenience was caused in connection with the tramway running from Newcastle to Tynemouth by the existence at the latter town of a narrow-gauge line. The new Minister should also take care that municipalities who refused running powers over their systems were compelled to grant such running powers.

Sir William Pearce said that there should be in the Bill some provision, short of taking possession or of purchase, which would give the Government reasonable control over such undertakings as municipal tramways. He suggested that the Home Secretary should bring forward a new clause, giving some control over municipal tramways.

Sir Frederick Hall said the Minister-designate had stated, on the second reading of the Bill, that the tramways undertakings were paying 7 per cent. He pointed out that the gigantic and well-managed tramways undertakings of the London County Council were not paying such a percentage. Municipal tramways, in his opinion, should not make a profit, for the reason that they were worked on behalf of the ratepayers. The great idea was "to give a pennyworth of tramway for a penny." He rather agreed with the amendment, because the tramways, as a rule, were run in a competent manner.

Mr. Shortt said he was impressed with the suggestion of Sir William Pearce that there might be in the Bill some general clause which would give power of control over such exempted services as municipal tramways. If a clause were suggested, the Government would be glad to consider it very sympathetically.

The amendment was agreed to.

EFFECT OF CONCESSIONS TO EMPLOYEES.

Mr. J. D. R. Cox, general manager, and Mr. R. Aitken, accountant of the Edinburgh and District Tramways Company, met the Tramways Committee of the Edinburgh Corporation on April 3rd at an emergency meeting, and explained the position of the company with regard to the proposed reduction in the hours under the National Agreement. The change would involve the company in a heavy loss unless they were permitted to increase the fares. The tramway employees had given notice to cease work on Sunday unless the company accepted the National Agreement. An application had been made to the Board of Trade for an increase in fares, and the company asked the consent of the Corporation to the application. The Committee agreed to support the application for sanction to an increase of the 1d. fare to 1½d., on the understanding that the tramway company would accept the National Agreement.

Mr. W. T. Robson, general manager of Southampton Corporation tramways, has stated that the reduction to 48 hours in the working week will entail an increase in the traffic staff of at least twenty pairs of men, and an increase in the wages bill of £12,000 per annum. To meet the situation it will probably be necessary to increase the existing fares by 50 per cent.

As a result of their deliberations, the Consultative Committee, consisting of the Tramways Committee and six additional members of the Council, presented a scale of increased tramway fares to Exeter Town Council at the recent meeting. On the understanding that the scheme would come up for ratification or amendment three months from the date it is put into force, the scheme was adopted by the Council.

Councillor R. H. Swain, chairman of the Nottingham Tramways Committee, said that in 1914 the amount of wages was £46,200, electrical energy cost £27,900, and other expenses amounted to £31,000, making the cost per car mile nearly 7½d. Under the 48 hours' agreement, with the same mileage as last year, the cost in wages alone would be £114,083, and including all other expenses the cost would be approximately 1s. 3d. per car mile, or exactly double what it was in 1914. In addition, large sums would have to be spent in rolling stock and permanent way. Already the sum of £24,000 had been spent and there was the cost of 25 new cars. Prior to the war their cars cost £940, and the last quotation was £2,300. Any reduction in the fares was impossible unless they made the undertaking a charge on the rates.

At Derby, under the National Agreement, the working week will be reduced from 60 hours to 48, and the men will be paid as for 57 hours. This will entail a further addition to the extent of nearly £20,000 per annum. It has been decided to work with two shift service of employees. Where that is impossible, the employees will be paid overtime rates. It is probable that penny fares will have to be increased, and possibly also higher fares.

Derby Town Council have recommended the Tramways Committee to raise the minimum fares for adults from 1d. to 1½d., and for children from ½d. to 1d.

At a meeting of the Wallasey Town Council Mr. W. H. Griffin, vice-chairman of the Tramways Committee, said that the recent arrangement for a 48-hour week for the tramway workers involved an increase of £10,000 a year in addition to previous grants.

Bath Tramways Company will incur an additional yearly expenditure of £6,400 as a result of the reduction in the working hours from 58 to 48 per week. The total wages bill is now practically double the pre-war amount. Sanction for the increase in tramway fares has not yet been received from the Board of Trade, but fares for char-a-banc tours are to be increased by nearly 50 per cent.

At a meeting of Glasgow Corporation on April 3rd, Mr. Kelly, convener of the Tramways Committee, said that they were expecting a report from Mr. Dalrymple, the general manager, on the subject of tramway fares, and the report would be communicated to the Corporation.

NEW AND PROSPECTIVE WORK.

Nelson Electricity and Tramways Committee recommend the extension of the plant at the generating station.

Darwen Corporation invite tenders for three double-deck vestibule bogie tramway cars, with electrical equipment. Particulars will be found in our advertisement columns.

York Tramways Committee recommend that application be made to the Local Government Board for sanction for a loan of £10,000 for the purpose of additional cars, £3,240 for triangles and circles at termini, and £2,400 for curves at Lendel Bridge.

The Bill which the Birmingham Corporation are promoting in Parliament includes the construction of tramways and works authorised by the Corporation Act of 1914, additional tramways along the Bristol road, and the enlargement of the borrowing powers of the Corporation in regard to the tramway undertaking.

Tramway and Omnibus Fares.—In reply to a question in the House of Commons, Mr. Bridgeman stated that the recent increases in fares on tramcars and motor omnibuses were understood to be mainly due to the increased cost of labour and materials. An increase in tramway fares over their statutory maxima had been allowed by the Board of Trade to certain undertakings under the Statutory Undertakings (Temporary Increase of Charges) Act, 1915, but the Board of Trade have no general control over the fares charged on motor omnibuses.

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MISCELLANEOUS NEWS AND NOTES.

Next Week's Issue.—Next Friday being Good Friday, the issue for next week will be published on Thursday, and all communications for that issue should reach us not later than Wednesday noon.

Railless Traction.—Representatives of the Lincoln Council have visited Bradford and Rotherham to inspect the railless systems.

York Joins National Industrial Council.—After considering the constitution of the National Joint Council of the Tramway Industry, the text of which was published in our issue of March 13, York Corporation Tramways Committee has agreed to become a member of the Council.

No Sunday Cars for Pontypridd.—In view of the strong protests made by the churches and the tramway employees, Pontypridd Council has decided to abandon the proposal to institute a service of tramcars in connection with the through running to Porth on Sundays.

Shorter Day Congests Tramways.—To a deputation from the Newcastle Trades Council, asking for a better service of workmen's cars, the General Manager pointed out that greater facilities could be provided but for the fact that the alteration of the hours in the factories brought them so close to the hours for ordinary traffic.

Liverpool's Tramway Purchase.—At a meeting of Liverpool City Council, on April 2, it was resolved to promote an Order under the Light Railways Act to purchase from the Lancashire Light Railways Company a length of three and a half miles of tramway between Knotty Ash and Prescot. The agreed price, according to Alderman Russell Taylor, was £18,000, but renewal of the track would cost from £27,000 to £30,000.

The Trolleybus.—Railless, Ltd., of 56, Moorgate Street, London, E.C., have issued a reprint in an attractive form of an article on "Trolleybus or Motorbus" which appeared in a recent issue of THE TRAMWAY AND RAILWAY WORLD. The pamphlet contains several interesting illustrations showing the flexibility of the railless system. Among the views are included trolleybuses at Shanghai, Bloemfontein, Bradford, Leeds, and Ramsbottom.

Industrial Reconstruction Council.—The first lecture of the third series arranged by the Industrial Reconstruction Council will be given in the Saddlers' Hall, Cheapside, E.C., on Wednesday, April 16th, at 4.30 p.m. The Chairman of the Council, Mr. E. J. P. Benn, will preside, and a lecture on the Industrial Situation will be delivered by Mr. Stephen Walsh, M.P. Applications for tickets should be made to the Secretary, 2 and 4, Tudor Street, E.C.

Breakdown on the District Railway.—Much inconvenience and delay was caused on Thursday morning between Blackfriars and the Temple stations by an axle breaking on a train on the District Railway. All stations west of the Temple were overcrowded, and to relieve the pressure many of the District city-bound trains were turned back at Charing Cross. The train which broke down in the tunnel was crowded with passengers, who had to sit in complete darkness until the train was restarted.

Gas-Driven Tramway Cars.—A New York Correspondent of the *Daily Express* reports that Mr. C. E. Sorensen, general manager of the Ford Tractor Company, announces that plans are being completed for the use of gas-propelled tramway cars. One of the designers of the Liberty engine used in American war aeroplanes has gone to Detroit to assist in the demonstration of the new cars, which, it is stated, will begin work over the Detroit tramways this summer. Mr. Sorensen is evidently an optimist on gas traction, and declares that electric tramcars now seen on city streets will soon become things of the past.

Liverpool's New Rolling Stock.—The first of the thirty motor omnibuses ordered by the Liverpool Corporation from the Associated Equipment Company has been delivered, and it is expected that the remainder will be delivered within the next two or three months. The new omnibus was described and illustrated in our issue of March 13th. It is of the single-deck type, with a closed compartment for the driver. About twenty-five of the hundred new tramway cars recently ordered will be ready within a few weeks, and the Committee hope by midsummer to be able greatly to improve their service.

Ministers' Motor Cars.—The Chancellor of the Exchequer has stated that before the war it was not the custom to supply ministers with motor cars at the public expense. During the war the position had changed and cars had been supplied to ministers holding the more important offices under the Crown. For the War Office, forty-three cars were employed, and their use was restricted to work in connection with public service. The whole question of the use of such cars by ministers or other officials was being considered by the Government with a view to its restriction as far as might be, and to the establishment of a stricter control than had been practicable under the exceptional conditions prevailing during the war.

Track Relaying and the Price of Rails.—Halifax Tramways Committee have received a letter from the Ministry of Labour stating that, having regard to the already serious state of unemployment in Halifax and district and the prospect of a further increase as demobilisation proceeds, the Divisional Council for Demobilisation and Resettlement strongly urges the necessity of putting in hand public works with a view to absorbing unemployed labour. The Committee passed the following resolution: "That while this Committee is desirous of carrying out forthwith the work of relaying the tramway track, the attention of the Municipal Tramways Association be called to the high price of rails and materials with a view to the appropriate Government Department being asked to fix a reasonable maximum price in connection therewith."

London Omnibus Fares.—Westminster Town Council have resolved to protest against the recently-expected increase of fares by the London General Omnibus Company, on the ground that it creates a traffic monopoly against the interests of omnibus users and the ratepayers. The Council propose also to ask the Government to appoint a Commission to investigate the working and management of the company, with a view to provide out of the revenue a direct contribution to the upkeep of the highways. Mr. J. P. Wallace, opposing the proposal, said that omnibuses brought trade to the city. Fares were already up 50 per cent., and if additional costs were imposed on the company, the fares would be increased.

Liverpool Committee to Visit America.—The Liverpool Tramways and Electric Lighting Committee have selected by ballot the following members as a deputation to visit cities in the United States and Canada to study tramway and electric supply improvements: Alderman Russell Taylor, Chairman; Mr. F. C. Wilson, Chairman of the Sub-Extension Electrical Committee; Mr. W. A. Robinson, leader of the Labour Party in the Council, and Mr. David Jackson. Two members are to be added from the Health Committee. The deputation will be accompanied by Mr. J. A. Brodie, city engineer, Mr. Harold Dickinson, city electrical engineer, Mr. C. W. Mallins, general manager of the tramways, Mr. A. G. Smith, city lighting engineer, together with the Committee clerk. Several members of the Tramways Committee have expressed their intention of accompanying the deputation at their own expense. The deputation will leave for New York on May 27th.

Reconstruction of Edinburgh Tramways.—The following recommendations for the future arrangements and reconstruction of the tramway system of Edinburgh were approved by the Town Council on April 9th: "That the overhead electric system should be adopted generally, subject to separate consideration being given to special parts of the city; that Princes Street should be separately considered; that preparations for conversion and reconstruction should be made at once; that conversion and reconstruction should be carried out in sections, the first to be undertaken being the section from Pilrig to Liberton; that tentative approval should be given to the extensions recommended in the tramway manager's report; and that a number, of motor omnibuses, not exceeding 15, should be acquired.

PERSONAL.

Mr. A. T. Kellet, has been appointed assistant permanent way engineer of Sheffield Corporation tramways, at a salary of £400 per annum.

Mr. A. R. Fearnley, general manager of the Sheffield Corporation tramways and motor department, has been retained by the Middlesbrough, Stockton and Thornaby Corporations to advise and give evidence in the negotiations and purchase of the Middlesbrough, Stockton and Thornaby tramways owned by the Imperial Tramways Company, which concern is being purchased by the three Corporations.

Mr. E. T. Brandon, electrical engineer of the Hydro-Electric Power Commission of Ontario, and **Mr. E. Buchanan,** local manager of the system at London, Ontario, are about to visit this country to interview British manufacturers, to study their methods, to let them know just what class of electrical material is required in Ontario, and to ascertain to what extent the manufacturers are prepared to compete in that province.

Sir Albert Stanley, President of the Board of Trade, in accordance with the doctor's orders, is not at present dealing with his official duties. In these circumstances Sir Auckland Geddes has undertaken the function of Acting President of the Board of Trade during Sir Albert Stanley's illness. The *Board of Trade Journal* states that there is every hope and expectation that Sir Albert will shortly be fully restored to health and able to resume his duties as President of the Board of Trade.

FINANCIAL.

Fuller's Wire & Cable Co. announce a dividend on both the preference and ordinary shares at the rate of 8 per cent. per annum.

Crossley Motors, Ltd.—The subscription list in connection with the offer of 300,000 £1 ordinary shares in Crossley Motors was closed on Wednesday, the issue having been largely over-subscribed.

W. T. Henley's Telegraph Works Co.—A final dividend is announced on the ordinary shares at the rate of 2s. 6d. per share, less income tax, making, with the interim dividend of 6d. per share, 3s. per share for the year.

Bombay Electric Supply and Tramways Co.—The directors recommend a dividend on the ordinary shares at the rate of 14 per cent. for half-year ended December 31, together with a bonus of 2 per cent for the year.

Northern General Transport Co.—After providing £5,189 for renewals, the profit balance is £38,841 as compared with £22,589 a year ago. The dividend on the ordinary shares is raised from 6 per cent. to 8 per cent., £1,584 is carried to the sinking fund for redemption of debenture stock, and the undivided balance is increased from £6,626 to £12,565.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended April 9 amounted to £74,928, an increase of £19,595 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to April 9 (one week and two days) the total receipts were £95,464, an increase of £23,684 on the corresponding period of 1918.

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CONTRACTS AND ORDERS.

St. Helens Electricity Committee has accepted a tender for cable from the British Insulated and Helsby Cable Co., Ltd.

The British Thomson-Houston Company's tender for six electric cars at £10,308, has been accepted by the East Ham Tramway Committee.

Dick, Kerr & Co., Ltd., are to supply ten new vestibule tramway cars, with equipments, at a price of £1,792 per car, exclusive of the truck, to Doncaster Corporation.

G. P. Trentham, Ltd., of Birmingham, have a contract with the East Ham Town Council for the reconstruction of permanent way to the value of £25,099, and for paving and concrete foundations for road margins at £18,222.

Bradford Corporation have accepted the following tenders; Rails, Walter Scott, Ltd.; tie-bars, Bayliss, Jones and Bayliss, Ltd.: rail bonds, British Insulated and Helsby Cables, Ltd.; welded rings, clips, bolts and nuts, E. Longbottom; and round steel rods, Crossley and Davenport.

BUSINESS NOTICES.

The address of Railless, Ltd., is now 56, Moorgate Street, London, E.C. (Telephone, London Wall 9080. Telegrams, "Skrailless, Phone, London.")

Owing to the amalgamation of Messrs. George Spencer, Moulton and Co., Ltd., with Messrs. Wood-Milne, Ltd., the address of the head office of the solid tire department of George Spencer, Moulton and Co., Ltd., from April 1 will be 42, Wigmore Street, London, W.1.

POSITIONS VACANT.

Engineer Salesman.

Engineer Salesman with good connection among tramways; must have good knowledge of equipment and permanent-way matters. Good selling ability essential. Salary £300 per annum and commission.—BOX No. 56, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

TENDERS INVITED.

DUBLIN CORPORATION.

Cleansing Committee.

Tenders for Tramway Wagon Wheels.

The Cleansing Committee of the Dublin Corporation are desirous of obtaining tenders for the supply of approx. 40 or 50 Wheels for use in connection with their Tramway Refuse Wagons.

Full particulars, including specifications, conditions of contract, drawings, etc., can be obtained at the under-mentioned office on payment of the sum of 10s. 6d. which sum will be refunded on receipt of a bona fide tender. The Committee do not bind themselves to accept the lowest or any tender.

Sealed tenders, marked on the outside "Tender for Wheels" and addressed to "The Chairman, Corporation Cleansing Committee, Lord Edward Street, Dublin," to be forwarded so as to reach the Offices of the Committee not later than 12 o'clock noon on Tuesday, the 15th day of April, 1919.

FRED J. ALLAN,
Secretary.

Cleansing Committee's Offices,
Lord Edward Street, Dublin.
April 5th, 1919.

FOR SALE.

One Heavy Treble-geared Tram-Wheel Lathe. Will turn two 33-in. wheels on Axle, standard gauge and fitted for boring tyres. Can be seen working on application. Price £250.

J. F. SIMPSON,
Engineer & Manager.

Corporation Tramways,
Deepdale, Preston.

THE ENGLISH ELECTRIC COMPANY LIMITED.

Abchurch Yard, Cannon Street, London, E.C.4.

This Company, with a Capital of £5,000,000, has been formed to consolidate under one direction and management the various interests of the following companies, in all of which a predominating control exists:—

COVENTRY ORDNANCE WORKS, LTD.
DICK, KERR & CO., LTD.
PHŒNIX DYNAMO MANUFACTURING CO., LTD.
UNITED ELECTRIC CAR CO., LTD.
WILLANS & ROBINSON, LTD.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C. ..	Mar. 31	323	425	+ 102	52	26,414	+ 2,922
Aberdeen Corporation ..	April 2	2,278	2,566	+ 288	44	113,868	+ 18,264
Ayr Corporation ..	" 5	492	530	+ 38	46	25,417	+ 5,331
Birkenhead Corporation	" 6	2,042	2,392	+ 350	⅞	1,978	— 64
Blackburn " ..	Mar. 25	1,601	1,881	+ 280	52	91,748	+ 14,274
Bradford Corporation ..	Apr. 5	6,309	7,741	+ 1,432	⅞	7,741	— 417
Burnley Corporation .	" 5	2,139	2,701	+ 642	..	..	..
Burton-on-Trent Cor. ..	" 6	406	401	— 5	1	401	— 5
Bury Corporation ..	" 6	1,783	1,845	+ 62	⅞	1,845	+ 62
Chatham & District ..	Mar. 27	1,290	1,246	— 44	12	14,716	+ 435
Cork Electric	" 27	669	501	— 168	12	6,476	— 806
Derby Corporation ..	Apr. 5	1,4.8	1,527	+ 69	52	77,620	+ 13,816
Dundee City	" 2	1,687	2,050	+ 363	46	90,358	+ 18,067
East Ham Corporation ..	" 5	1,353	1,704	+ 351	52	82,032	+ 11,020
Glasgow Corporation ..	" 5	29,475	30,419	+ 1,944	44½	1,264,676	+ 92,240
Glossop (U.E. Sup. Co.) ..	" 5	195	215	+ 20	14	2,977	+ 451
Halifax Corporation ..	Mar. 25	2,648	2,495	— 153	51½	143,905	+ 19,525
do. Motor Buses ..	" 25	56	56	Nil	51½	3,441	+ 890
Huddersfield Corporation	Apr. 5	4,400	3,911	— 489	1	3,911	— 489
Ilford U.D. Council ..	" 5	997	1,072	+ 75	⅞	816	+ 100
Ipswich Corporation ..	" 5	771	690	— 81	⅞	536	— 35
Isle of Thanet ..	" 5	286	530	+ 244	26⅞	8,574	+ 3,748
Kilmarnock Corporation	" 5	249	264	+ 15	46⅞	12,408	+ 2,661
Lanarkshire	Mar. 27	3,463	3,577	+ 114	12	44,566	+ 5,269
Leeds City	Apr. 5	12,824	14,915	+ 2,091	⅞	11,336	+ 1,521
Leicester Corporation ..	" 5	4,765	5,207	+ 442	..	..	..
Leyton U.D. Council ..	" 2	2,096	2,608	+ 512	1	2,608	+ 512
Liverpool Corporation ..	" 5	17,784	21,354	+ 3,570	13½	273,663	+ 46,862
Llandudno & Colwyn Bay	Mar. 28	327	313	— 14	17	5,022	+ 891
London County Council ..	Apr. 9	55,333	74,928	+ 19,595	13⅞	95,464	+ 23,684
Maidstone Corporation ..	" 3	378	394	+ 16	⅞	394	+ 16
Manchester Corporation	" 5	24,664	28,065	+ 3,401	1	1,391,998	+ 253,605
Newcastle-on-Tyne Cor.	Mar 29	8,805	8,478	— 327	52	457,998	+ 43,520
Northampton Cor. ..	" 21	916	1,123	+ 207	51	45,911	+ 2,498
Nottingham Corporation	Apr. 3	3,323	2,800	— 523	—	—	—
Oldham Corporation ..	Mar. 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation ..	" 27	1,253	1,339	+ 86	51½	67,336	—
Rhondda Tramways ..	" 20	1,633	2,150	+ 517	11	23,210	+ 5,603
Rotherham Corporation	Apr. 1	2,168	2,119	— 49	52	118,397	+ 20,829
Sheffield Corporation ..	" 6	13,883	16,725	+ 2,842	1⅞	28,012	+ 5,224
Southampton Cor. ..	" 2	2,613	2,476	— 137	⅞	760	— 495
Southend-on-Sea Cor. ..	Mar. 26	707	1,145	+ 438	51	66,771	+ 22,597
South Shields Cor. ..	" 15	1,014	1,203	+ 189	50	57,737	+ 9,276
Sunderland Corporation ..	Apr. 6	2,179	2,498	+ 319	1	2,498	+ 319
Swindon Corporation .	Mar. 26	301	264	— 37	51⅞	15,687	+ 1,467
Torquay Tramways .	" 27	820	752	— 68	12	8,867	+ 578
Tyneside Trys. & Trmrds.	" 19	902	896	— 6	12	9,189	+ 215
Wallasey Corporation ..	Apr. 5	1,846	2,110	+ 264	⅞	1,626	— 49
Walsall Corporation ..	" 5	1,451	1,315	— 136	⅞	997	— 313
Walthamstow U.D. Coun.	" 5	1,504	1,526	+ 22	1	1,526	+ 22
Warrington Corporation	Feb. 20	725	851	+ 126	51	39,949	+ 8,793
West Ham Corporation	Apr. 3	4,184	4,884	+ 700	52	242,848	+ 49,423
Wigan Corporation .	Jan. 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Apr. 1	£53,346	£61,541	13	£736,000	+ £31,093
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,882
Ballarat and Bendigo (4 wks)	Jan. 5	4,505	4,504	40	35,478	+ 2,167
Brazilian Traction (Mlrs.)	Jan.	7,837,000	8,522,000	4	8,522,000	+ 685,000
Brisbane	Feb.	32,009	34,380	8	72,955	+ 6,446
British Columbia .. $	Feb.	501,150	545,415	34	4,740,999	+ 756,620
Buenos Aires Lacroze ..	Mar.	42,647	47,370	39	390,579	+ 44,158
Burmah Tram. & Light Rs.	Feb.	22,985	35,926	30	250,730	+ 66,495
Calcutta .. .. Rs.	Mar. 29	66,690	81,666	12½	1,089,887	+ 169,013
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Mar.	5,316	2,400	13	8,406	— 4,952
Cordoba	Jan.	12,844	13,942	44	145,654	+ 10,915
East India	Mar.	1,729	2,016	34	15,628	+ 5,132
Hong Kong .. .. $	Feb. 15	18,149	13,611	7	100,890	+ 6,572
Kalgoorlie	Nov.	2,641	2,933	48	30,838	+ 1,274
La Plata	Mar.	5,348	6,592	13	18,019	+ 1,971
Lima	Jan.	43,561	45,362	4	45,362	+ 1,801
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Feb. 28	33,553	35,254	6	166,609	+ 17,415
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	+ 83,959
Manila .. .. $	Jan.	167,000	231,585	4	231,585	+ 64,585
Montevideo	Mar.	36,659	41,070	21	190,891	+ 18,558
Para	Jan.	24,060	24,515	8	48,315	+ 940
Pernambuco	Apr. 6	4,616	5,811	13⅞	73,533	+ 8,533
Peruvian .. .. $	Feb.	925,410	943,470	34	7,973,835	— 229,195
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Mar.	5,955	7,533	13	19,600	+ 2,622
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore .. .. $	Mar. 1	14,640	15,489	9	145,471	+ 26,179
Toronto .. .. $	Feb.	981,933	1,015,797	8	2,122,637	+ 72,385
Winnipeg .. . $	Feb.	298,899	371,162	8	761,701	+ 128,160

WANTED.

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THE
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SATURDAY, APRIL 19, 1919.

AN UNSOUND FARE POLICY.

LONDON County Council Highways Committee has presented its scheme for the revision of tramway fares rendered necessary by the terms of the new national agreement as to hours and wages. The additional cost laid upon the undertaking by that agreement is estimated at £360,000 per annum. Additional revenue to meet that vast increase in working costs can only be obtained by increased traffic and higher fares. In some cases a mere increase in fares might be adequate for the purpose, but that policy is impossible to London tramway authorities. To raise fares in such proportion as would balance the increased expenditure could only defeat the purpose of the expedient, and the Highways Committee is fully aware of the peril. The details of the scheme are set out in another column, but there is one section to which special attention should be called. The estimated annual loss on the basis of workmen's fares at present in force is £160,000, and even under the proposed revision the loss would still amount to £105,000 a year. That is to say, London tramway authorities deliberately propose to carry a certain class of passengers at less than cost. According to the definition made by practice, a workman is a person who goes to employment any time before 8 a.m. But there are thousands of workers in London who do not start work till 9 or 9.30 a.m. who are at least equally entitled to the privilege. As a rule, it is the adult male worker who is able to take advantage of workmen's fares. Engineers, mechanics, electricians, men engaged in the building trades and in various manufactures generally start work before 8 a.m., but warehousemen, clerks, typists, shop assistants, and a vast miscellany of workers have not to make so early a start. Therefore, in the view of the Highways Committee, the latter are not workers, nor entitled to the privilege of workmen's fares. The fastastic folly of that proposition is self-evident, and the results of the false method of discriminating between one class of worker and another are glaringly unjust and oppressive. The warehouseman earning £100 a year has to help in paying the tramway fares of an engineer wtih £200 a year, and the young typist with 25s. a week must subsidise the travelling expenses of a man earning three times her income. In fairness it must be noted that the Highways Committee aim at reducing the loss on workmen's fares by £55,000, and they are entitled to claim some credit for venturing to trench upon the privilege of what is evidently a powerful class. But it is not by modifications of that sort a just system of fares can be devised. The only just principle of fixing tramway charges is that the passenger shall pay the cost of his ride. Starting from that basis, a rate of charges can be fixed which inflicts hardship on no one. Having got its due, the tramway authority may dispense what profit has been gained in any way it pleases. If a surplus is made on a tramway system, and the owners of the undertaking decide that it should be spent on welfare schemes for workers, the matter may be left for them to decide. But to take money from one class of passengers to give it to another is unjust, and when the class to whom benefit is assigned does not differ essentially from any other class, the practice becomes grossly foolish.

EFFECT OF CONCESSIONS TO EMPLOYEES.

The London General Omnibus Company on April 13 made further alterations in motor omnibus fares, in continuation of the changes which came into operation on March 27. The increases have been made in order to meet the additional working costs caused principally by higher wages and the high price of fuel.

The London United Tramways on April 12 made further increases in their fares, and the charge is now 1d. per mile for ordinary passengers and ½d. a mile, minimum 1d., for workmen. Before the change in fares in January the average 1d. stage was 2¾ miles in length for ordinary passengers, and in some cases the distance that could be travelled for this sum was over three miles.

Fares on the Burton-on-Trent Corporation tramways have been increased by about 50 per cent., the minimum fare being now 1½d.

NEW AND PROSPECTIVE WORK.

Aberdeen Corporation has received sanction for a loan of £100,000 for power station extensions.

Blackburn Corporation propose to apply to the Local Government Board for sanction to borrow £250,000 for a new electrical station.

The Electrical Engineer of Halifax Corporation has been directed to obtain a quotation for a 1,500 kw. rotary converter, switchgear and transformer.

The cost of the new generating station at Kirkcaldy is estimated at £290,000. The Town Clerk and the Electrical Engineer have been appointed to interview Government officials in regard to arrangements to meet the financial requirements of the scheme

INCREASE IN LONDON TRAMWAY FARES.

The annual cost to the London County Council of giving effect to the agreement providing among other concessions for a 48-hour week, is estimated at £360,000. The effect of this charge on the tramways undertaking has been carefully considered by a sub-committee presided over by Mr. W. J. Squires, chairman of the Highways Committee, and as a result, on Tuesday the Committee recommended to the Council that the 1d. stage should be reduced from 1.8 miles to 1.5 miles, with a single overlap in place of the present double overlap. This will involve each route being divided into sections of .75 miles, two consecutive sections to be traversed for 1d., four for 2d., etc. Under the present arrangements the sections are of an average length of .6 of a mile, and any three of these can be traversed for 1d. The increased revenue anticipated from the proposed revision is £416,000, while a saving of £40,000 is hoped to result from the improved fare collection owing to the shortening of the stages and the reduction in the hours of work for the employees. The following scale will be adopted for workmen's return tickets :— for a return journey over a stage of 2 miles (total journey 4 miles) 2d., over a stage of 3 miles (total journey 6 miles) 3d., 4 miles (total journey 8 miles) 4d., and above 8 miles total journey, 5d.

The Highways Committee in their report stated that the upward trend of wages had been continuous since 1914, as shown in the following comparison :—

	1913-14	1918-19	1919-20 (est.)
Total wages bill ..	1,102,220	1,888,600	2,421,250
Car mileage ..	59,209,289	48,052,801	53,000,000

War service allowances to men during the year 1918-19 amounted to £180,000, and the estimate for the current year for the smaller

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number of men still on service is £50,000. Simultaneously with the increase of wages the price of coal and materials has advanced in many cases more than 100 per cent. Another factor is the urgent need for renewals of track and paving, which it has been impossible to carry out during the war owing to the shortage of labour and the impossibility of obtaining materials. The working expenses since the year 1913-14 are given below.

Year.	Car miles run.	Working expenses. £	A car mile. d.
1913-14	59,209,280	1,585,251	6.50
1914-15	58,978,792	1,684,243	6.89
1915-16	47,879,675	1,683,660	8.44
1916-17	49,478,973	1,817,693	8.82
1917-18	49,189,866	2,128,685	10.38
1918-19 (est.)	48,052,801	2,811,465	14.04
1919-20 (est.)	53,000,000	3,521,925	15.94

The renewals fund, which at March 31, 1914, stood at £539,749, at March 18, 1918, was reduced to £324,451. Up to the year 1911-12 a provision of two-thirds of a penny for each mile run had been paid to the renewals fund, but for the last six years provision could not be made on this basis, but the available surpluses have been paid into the fund. The general reserve fund on March 31, 1918, stood at £74,667, against £190,596 on March 31, 1914.

In May, 1917, the halfpenny fares were suspended and the average distance for a penny was reduced from 2 miles to 1.8 miles, and other reductions were made.

The draft estimates of expenditure, including renewals, for the year 1919-20 show that if the present balance of the renewals and reserve funds (£392,000) is to be preserved, the revenue of the tramways undertaking must be increased from £3,629,000 to £4,668,000, or over a million pounds over the receipts for the year 1918-19, which was £600,000 more than the receipts for 1917-18. Nearly half the extra revenue required, if the estimates are realised, will be derived from running an additional five million car miles, and obtaining somewhat higher average receipts, leaving a sum of about £566,000 to be raised by other means. In order to obtain the necessary revenue an increase in fares was imperative, but it had to be remembered that there was a point beyond which an increase in fares might cause a reduction in revenue. In view of all the circumstances the Committee recommended the proposal set out above.

The estimated annual loss on workmen's tickets on the basis of the present fares is £160,000, and under the proposed revision the loss will be reduced to £105,000 a year.

It is anticipated that it will be necessary to draw upon the renewals fund to the extent approximately of £150,000 in order to meet the expenditure of £371,480 for renewals during the year 1919-20.

The Committee propose later to consider the suggestion that the tramways undertaking should be relieved of the charge of street improvements along tramway routes, rates on track and war service allowances, and that the period for the repayment of loans should be extended beyond twenty-five years.

The fare revisions will be reconsidered in six months' time, when information will be available as to the financial results obtained.

MISCELLANEOUS NEWS AND NOTES.

The Daimler 1919 Car.—The Daimler Company have published an illustrated specification of their 1919 cars, and copies may now be obtained from the company or from any of their recognised agents.

Coal Restrictions.—Owing to the restrictions by the Coal Controller, the Chatham and District Light Railway Company are still unable to resume the services on the Strood Hill route, which have been suspended during the war.

Effect on Car Traffic of Miners' Baths.—As a result of the institution of baths for miners at Atherton, Lancashire, it is stated that the miner no longer besmirches the seats of tramway cars and railway carriages with the grime of his calling.

Liverpool Tramways Committee has determined to put a stop to the disgusting habit of spitting on cars. At the City Police Court on April 11, six men were summoned for the offence and the magistrate inflicted a fine in each case of 10s.

Leeds Passenger's Death by Falling from Stairway.—As Mr. J. W. Crowther was mounting the steps of the upper deck of a Leeds tramway car, the car was started and he fell over the handrail to the ground, sustaining injuries which resulted in his death.

Objection to Centre Standards.—Ealing Town Council desires to have the centre tramway standards removed from Uxbridge main road and replaced by side poles, and negotiations are proceeding between them and the London United Tramways for the purpose

Sunday Omnibuses for Teeside Workmen.—The difficulties with the Teeside workmen arising from the suspension of the Sunday tramway services were removed by the consent of the Imperial Tramways Company to run a service of motor omnibuses on Sunday solely for the use of workmen.

New Motorbus Service at Huddersfield.—The motor omnibus service recently instituted between the Huddersfield Corporation, Waterloo tramway terminus and Kirkburton has proved a great convenience, not only to the residents in the district, but also to visitors to Storths Hall Asylum. The service is hourly, and the two omnibuses employed on the route have been fully engaged, especially on Sundays, when there is no train service to Kirkburton.

The Restriction of Motor Vehicle Imports.—The new Consultative Council on Imports on April 11 issued, under the authority of Sir Albert Stanley, President of the Board of Trade, a new list of restricted and freed imports. The restrictions include the following:—Motor vehicles and accessories restricted to 50 per cent. of 1913 imports until September. 1, 1919.

Strike on Lanarkshire Tramways.—Owing mainly to the dismissal of a woman worker for failing to obey the instructions of an inspector, the employees of the Lanarkshire Tramways Company ceased work on Friday. The employees maintained that as the inspector was off duty at the time, he had no right to report the woman for disobeying instructions.

B.E.T. Gives Barrow Time.—At the recent meeting of Barrow Town Council, the question of purchasing the tramway undertaking which serves the town from the British Electric Traction Company, the present owners, was brought up. The option to purchase expired on April 10th, but the company had agreed to extend the period of option for three months.

Edinburgh Corporation Tramways Employees.—As the Edinburgh tramway system passes into the hands of the Corporation on July 1, the men at present employed are anxious to know the conditions under which they will be taken over by the Corporation The men have already resolved that they must be dealt with through their union and not individually.

Glasgow Releases Women Drivers.—The employment of women drivers on the Glasgow tramway cars terminated on April 12. The tramways department has dispensed with the services of 150 women and has transferred women drivers to the duties of conductors. Glasgow was the first corporation to employ women as drivers.

Leicester Needs More Buses.—Before the war Leicester Tramways Committee had made everything ready for starting a motor omnibus service to Syston, by the Thurmaston route, when the Government stepped in and commandeered the omnibuses, which did service in France instead. Leicester Corporation is now on the outlook for omnibuses wherewith to start the service.

Motor Spirit.—Mr. Bridgeman, in reply to a question in the House of Commons recently, said that there was a fairly good stock of motor spirit available at present in this country for civilian purposes. The maximum prices for motor spirit are at present in operation, and he could not say if any reduction in price was to be expected in the near future He did not contemplate any increase in price.

Vehicle Workers' Combination.—The result of the ballot on the proposed amalgamation of the London and Provincial Union of Licensed Vehicle Workers and the Amalgamated Association of Tramway and Vehicle workers resulted in a large majority in favour of the combine. The two unions, which have a total membership of about 90,000, are members of the National Transport Workers Federation.

Carlisle Tramway Car Licences.—The Carlisle Watch Committee recently limited the tramway car licences to a period of three months, in order to see how certain improvements promised by the company progressed. The period expired at the end of the present month, and the General Purposes Committee, at a meeting on April 10, reported that the company were doing their utmost to improve the condition of the tramways. The Watch Committee accordingly agreed to continue the licences for a further period.

Peterborough Cars Boycotted—Owing to the withdrawal of the early workmen's cars and the dinner hour workers' service, a boycott has been proclaimed at Peterborough by the men employed at large engineering works. A resolution has been passed pledging the workers not to use the service during any part of the day, and also to influence others in the same direction until the demands of the workers have been granted. It was further resolved to approach the President of the Board of Trade on the matter.

York Tramwaymen's Wages Raised.—At a recent meeting of York Corporation Tramways Committee, the Tramway Manager, Mr. J. W. Hame, reported the result of negotiations with the tramway employees on the question of wages and hours of work. The Committee have agreed to pay the employees a war wage of 30s. per week to a man who has worked his full six days or six shifts on rota duty, and an extra 5s. when he is required to work a shift on the seventh day, overtime to be paid on a certain hourly basis.

Cardiff improves its Service.—Step by step, Cardiff tramway services are being brought back to pre-war efficiency. A short time ago improvements were made in the services, and at the beginning of last week additional cars were put on to the routes to the centre of the city both early morning and late evening. Services now start at 5.10 a.m., from various outlying termini, with additional cars, and the running continues up to 11 p.m. Stopping places in abeyance during the war have now been restored.

Interpretation of Tramway Agreement.—Considerable differences exist between the tramway employers and employees with respect to the interpretation of the agreement arrived at on March 20, and meetings have taken place at which these points have been discussed, but a settlement has not yet been reached. The Licensed Vehicle Workers' Union at Bristol has complained to the Bristol Trades Council, alleging a breach of agreement by the Tramways Company. Clauses Nos. 1 and 4 of the agreement are involved. Clause No. 1 provided that the previous wage for 57 hours should be paid for 48 hours. Clause 4 covered an arrangement for a conference between the employers and the men prior to the split duty being put into operation.

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Aberdeen Requires 18 More Tramcars.—At present Aberdeen Corporation Tramways Department has 82 tramway cars, but the management has decided that, to provide for increased traffic and to meet emergencies, at least 100 cars are required. With characteristic caution, the Tramways Committee has authorised the constuction of two cars only, in the hope that prices will fall while these are being built. Before 1914, a car could be produced for £800, and at present the cost is £2,400. For some time past, the new cars required by the Corporation have been built in Aberdeen.

Transport Ministry Staff.—Preliminary to organising the staff of the Transport Ministry, Sir Eric Geddes has requested the North Eastern Railway Company to lend the services of Mr. R. F. Dunnell, secretary and solicitor to the company, for a further period. With a view to preventing disappointment among those who hope to find places on the staff of the new Ministry, Sir Eric has stated that the additional requirements of the staff will be limited to a few highly-skilled technical experts, who will be called upon to assist the officers of existing Government Departments whose functions are to be transferred to the new Ministry.

Glasgow Fares.—Mr. James Dalrymple, general manager of the Glasgow Corporation tramways, has, it is understood, completed his report on fares, and copies will be circulated at the next meeting of the Finance Sub-Committee on April 23. Later the whole matter will be reviewed by the Tramways Committee, who will make a recommendation to the Corporation. It is anticipated that whatever changes are agreed upon will not come into effect until June 1, when the civic financial year begins. The manager has already indicated that he favours the abolition of halfpenny fares. No alteration has yet been made in the Glasgow fares since the war.

Railway Wagon Repairs.—There are great arrears in the repair of railway wagons. Thousands of these vehicles remain unused for this reason. The Minister of Labour applied for the release of about 400 pivotal men in private wagon repair firms, and the majority of these men have already been released. Mr. Wardle, on behalf of the Board of Trade, recently stated that only a very few of the men belonging to private wagon repair firms remained in the Forces and the release of these would be expedited as much as possible. The question of expediting the release of railway workshop men is also being considered.

A Van Driver's Negligence.—Judgment was given in favour of the London County Council Tramways in the Clerkenwell County Court on April 7th in an action for damages for personal injuries sustained by a passenger who was thrown violently against a seat owing to the car stopping suddenly with a jerk. The judge held that the driver of the car was not guilty of negligence, as he had stopped the car to avoid a collision. He gave judgment against Messrs. Bushnell and Sons, carmen and contractors, against whom an action was also brought, ruling that the injuries were received by the negligence of their van driver.

The B.E.A.M.A. New Members.—We are informed that the following firms have been elected members of the British Electrical and Allied Manufacturers' Association:—Accumulators (Birmingham), Ltd., Birmingham; Brolt, Ltd., Birmingham; Davies, Kent and Stewart, Ltd., London; Ebonestos Manufacturing Co., Ltd., London; Hightensite, Ltd., London; Helden and Brooke, Ltd., London; Jensen and Nicholson, Ltd., London; Joyner, Chas., and Co., Ltd., Birmingham; Lyon and Wrench, Arthur, Ltd., London; Parkinson, F. and A., Ltd., Leeds; Slaughter, T. E. and Co., London; Vandervelde, L., London; Wardle Engineering Co., Ltd., London; Wiggin, H., and Co., Ltd., London.

48-Hour Week for Omnibus Men.—Representatives of the omnibus employers and workers, after negotiating at considerable length, have attained agreement on the following terms: The working week is to be fixed at 48 hours. Every worker is allowed an annual holiday of six days with pay, and employees with six months' service to their credit on January 1st are to be entitled to the annual bonus. With regard to extra payments, the following rates have been arranged: Payment of time and a quarter for Good Friday and bank holidays, double pay for Christmas Day, payment for overtime at the rate of time and a quarter for the first two hours over the 48, and time and a half after that.

Music in the Parks—A Tax on Passengers.—Sheffield Tramways Committee propose to contribute £200 towards the cost of music in the parks. The *Sheffield Daily Telegraph* remarks that it has no great liking for these tramway contributions. They are useful when there is a doubt as to the legality of paying for anything from the rates, but it should be quite possible to pay for music in the parks as part of the ordinary maintenance charges. If that is not so, then the tramway's contribution will come in useful If it is so, then it would be very much better that the cost of music in the parks came directly from the rates. It certainly is not just that tramway passengers should be taxed for luxuries.

Belfast Cars Damaged.—At Belfast on April 14 three tramway cars bound for the shipyards were rushed by about three hundred people, who filled the cars to such an extent that they could not be moved. The crowd resented attempts to reduce the crowding, and the windows and woodwork of the cars were smashed. One of the cars containing about seventy men was finally started, and when it reached Musgrave Street barracks it was surrounded by police. The men were removed and their names taken. Many protested that having boarded the car they were unable to leave it, and had nothing to do with the damage. The trouble appears to have arisen from passengers waiting for the last possible cars, as the tramway officials stated that many earlier cars left only partially filled.

The Cippenham Affair.—The first meeting of the Joint Committee of the House of Lords and the House of Commons, appointed to enquire into what is known as the "Slough Motor Depot Scandal," met on Tuesday, April 15, in Committee Room C of the House of Lords. Lord Kintore was appointed Chairman of the Committee, and a resolution was passed that the proceedings should be open. The Committee then adjourned till Friday, May 2, after which date the sittings will be held regularly every Wednesday and Friday, commencing at 11 a.m. Before evidence is taken, statements by Lord Inverforth and Lord Desborough are to be considered by the Committee. Slough Urban District Council has passed a resolution instructing its Parliamentary Committee to consider the Government inquiry in so far as it affects the district, and to report thereon as early as possible.

Reinstatement of Ex-Service Men.—At the meeting of Hull City Council, on April 3, Councillor Richardson proposed:—"That in the case of Corporation employees who on demobilisation are found to be physically unfit for the work previously performed by them, it be an instruction to heads of departments that work shall be found for these men which they are capable of performing, either in the department previously employing them or by consultation with heads of other departments. That such employment shall be so arranged that the total of the men's wages, plus any disability pensions, shall not be less than the current wages for the work he was on prior to enlistment, and that it be an instruction to heads of departments to report any cases when they are not able to carry out the terms of the foregoing to the committee concerned as speedily as possible."

London United Tramways.—On Tuesday, April 8th, Mr. Justice Astbury sanctioned the scheme of arrangement and reduction of capital of the London United Tramways. Counsel stated that, after prolonged negotiations with local authorities, an Act of Parliament was obtained in 1918, whereby the times at which local authorities could compulsorily purchase was put into one date, namely, 1950, and the company was allowed to charge somewhat higher fares. By the reconstruction scheme, accepted by share and debenture holders, and now sanctioned by the Court, it is proposed to reduce the share capital from £2,500,000 to £656,250 divided into 125,000 preference shares of £5 5s. each, which were to be sub-divided into 21 fully-paid shares of 5s. each, and each preference share was to be converted into one ordinary share of 5s. The capital was thereafter to be increased to £1,619,250 by the creation and issue of 963,000 new £1 preference shares.

Home Office and Motor Omnibuses.—In the House of Commons, on April 8, Mr. Gilbert asked the Home Secretary what powers his department had over motor omnibuses in London and district, and if they had any control over routes or fares? In reply, Mr. Shortt said that by the Metropolitan Public Carriage Act, 1869, the Secretary of State for the Home Department is given power to grant licences for stage carriages, their drivers and conductors. This power by successive Orders he had delegated to the Commissioner of Police, who caused each vehicle to be inspected and, if found fit, licensed for public use. Interference with the routes of public omnibuses is entirely forbidden by the Metropolitan Streets Act, 1869, but before licensing a stage carriage its fitness for the particular route is considered by the Commissioner. The amount of fares chargeable is in the discretion of the proprietor of an omnibus. The powers of the Secretary of State are confined to the Metropolitan Police district.

Edinburgh Tramways Conversion.—In discussing the system of electric traction to be used in Princes Street, the Edinburgh *Scotsman* commends the Town Council for having deferred a decision. To have decided precipitately upon the erection of overhead wires, our contemporary thinks, would have been a gross indiscretion, and would have provoked a strong protest. There are two sections of opinion in the Town Council, which correspond in the main to current public feeling in the city. One party advocates the overhead system, no matter what the effect upon the appearance of Princes Street. The other, and this is represented by Mr. J. Harrison, convener of the Tramways Committee, who is supported by the Lord Provost, desires to defer a decision until the Council and the community have all the relevant facts before them with respect to the costs and comparative merits of the overhead and conduit systems. The installation of the overhead system from Pilrig to Liberton is to be begun as soon as possible, and will probably occupy two years in construction. The Portobello section will follow and four or five years may pass before Princes Street is reached, so there is ample time to consider the matter. The deputation which visited London to investigate working and costs of the conduit system has not yet reported. Our contemporary thinks that before the question is finally settled other factors may be included in the problem.

PERSONAL.

Mr. A. S. Blackburn, electrical engineer of Sunderland Corporation, has been granted an increase in salary of £200 to £1,200.

Mr. Thomas Roles, city electrical engineer of Bradford, has been granted an increase in salary of £250 to £1,250 per annum.

Sir John Aspinall, ex-general manager of the Lancashire and Yorkshire Railway, has joined the board of the English Electric Company, Ltd.

Mr. William Morris, of Messrs. Ashurst, Morris, Crisp and Company, has been appointed a director of the Anglo-Argentine Tramways Company, Ltd., and **Mr. W. D. Dawes** has been appointed London manager and secretary.

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CONTRACTS AND ORDERS.

Reading Tramways Committee have recommended the purchase of five motor omnibuses, at an estimated cost of £7,750.

The British Automobile Traction Company are to supply a motor chassis for a rail welding machine and tramway tower wagon for Reading Corporation.

Darlington Rural District Council invite tenders for the supply of a five-ton petrol motor chassis. Full particulars, including date of delivery, must be sent to Mr. C. H. Leach, Clerk to the Council, Darlington, by April 21.

The English Electric Company—in which, it will be remembered, are now consolidated the various interests of the Coventry Ordnance, Dick, Kerr, Phœnix Dynamo, United Electric Car and Willans and Robinson Companies—has secured an order from the Huddersfield Corporation for a 5,000 kw. turbo-alternator set, speed 3,000 r.p.m.; and another from the Nottingham Corporation for a similar turbo-alternator set of 3,000 kw. output, together with surface condensing plant and cooling tower. The latter contract also includes the supply of rotary converters and an equipment of Ferguson superheaters to existing Lancashire boilers to secure economies in steam consumption with the new turbine. This plant will be installed in the two Nottingham power stations, together with interconnecting E.H.T. switch-gear and transformers.

It was mentioned in a recent issue that **John I. Thornycroft and Company, Ltd.**, had received an order for a type "J" motor chassis from Southampton Corporation tramways. The order was, however, for six machines of that type. Among a large number of other orders now being executed for the same firm for their type "J" chassis for public service vehicles are the following:—Six for the Great North of Scotland Railway, six for the Great Eastern Railway, eleven for the various branches of the Provincial Tramways Company, and ten for the Portsmouth Corporation, the latter to be fitted with double deck omnibus bodies. Another order is from the British Automobile Traction Company, who have already purchased a large number of Thornycroft's type "J" chars-a-bancs chassis. With the exception of the orders from Southampton and Portsmouth, all the above are repeat orders.

FINANCIAL.

Rochdale Corporation Tramways.—The receipts for the past year amount to £110,560, an average of 18s. 3d. per car mile.

Rhondda Tramways.—The gross revenue of the Rhondda tramways increased from £82,225 to £98,862 for the year 1918, and the number of passengers carried rose from 12,865,806 to 13,926,707. Operating costs fell from 77.14 per cent. to 73.09 per cent. There is an available balance of £34,733. Deducting rent paid to the Rhondda Council, depreciation, debenture interest and reserves, the balance is £17,044. The directors propose to add £10,000 to the reserve for renewals, bringing it up to £36,000, and to pay a dividend of 6 per cent. on the preference shares, 4 per cent. being the balance on account of 1913, and 2 per cent. on account of 1914, carrying forward £1,044.

Change of Address.—All communications for Dick, Kerr & Co., Ltd., or for individuals connected with the Company should now be addressed as follows:—The English Electric Company, Ltd., Queen's House, Kingsway, London, W.C.2.

POSITION WANTED.

Tramway Engineer, as similar, or Chief Assistant, etc. Nineteen years' experience; costs; records; stores; overhead; cables; rolling stock; car works; used to control of men and women.—Box No. 57, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

FOR SALE.

One Heavy Treble-geared Tram-Wheel Lathe. Will turn two 33-in. wheels on Axle, standard gauge and fitted for boring tyres. Can be seen working on application. Price £250.

J. F. SIMPSON,
Engineer & Manager.

Corporation Tramways,
Deepdale, Preston.

THE
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Queen's House, Kingsway, London, W.C.2.

This Company, with a Capital of £5,000,000, has been formed to consolidate under one direction and management the various interests of the following companies, in all of which a predominating control exists:—

COVENTRY ORDNANCE WORKS, LTD.
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TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C.	Apr. 7	763	580	— 183	1	580	—
Aberdeen Corporation	„ 9	2,265	2,868	+ 603	45	116,737	+ 18,867
Ayr Corporation	„ 12	367	478	+ 111	47	25,895	+ 5,432
Birkenhead Corporation	„ 13	1,894	2,353	+ 459	1½	4,331	+ 432
Blackburn „	„ 9	1,441	2,086	+ 645	2½	4,855	+ 361
Bradford Corporation	„ 5	6,309	7,741	+ 1,432	½	7,741	— 417
Burnley Corporation	„ 12	2,014	3,003	+ 989	..	..	..
Burton-on-Trent Cor.	„ 13	361	404	+ 43	2	704	+ 43
Bury Corporation	„ 13	1,626	2,176	+ 550	1½	4,022	+ 613
Chatham & District	„ 3	1,342	1,308	— 34	13	16,024	+ 402
Cork Electric	„ 3	621	558	— 63	13	7,034	— 869
Derby Corporation	„ 12	1,279	1,518	+ 239	2	2,810	+ 73
Dundee City	„ 9	1,613	2,183	+ 570	47	92,541	+ 18,637
East Ham Corporation	„ 12	1,268	1,827	+ 559	1½	3,096	+ 868
Glasgow Corporation	„ 12	29,122	31,211	+ 3,089	45½	1,295,887	+ 95,351
Glossop (U.E. Sup. Co.)	„ 12	171	225	+ 54	15	3,203	+ 505
Halifax Corporation	„ 6	2,376	3,080	+ 704	1½	3,454	— 274
do. Motor Buses	„ 6	53	71	+ 18	1½	81	Nil
Huddersfield Corporation	„ 5	4,400	3,911	— 489	1	3,911	— 489
Ilford U.D. Council	„ 5	997	1,072	+ 75	½	816	+ 100
Ipswich Corporation	„ 12	617	747	+ 130	2	1,283	+ 103
Isle of Thanet	„ 12	212	562	+ 350	27½	9,136	+ 4,098
Kilmarnock Corporation	„ 12	238	288	+ 50	47½	12,696	+ 2,710
Lanarkshire	„ 3	3,732	3,595	— 137	13	48,161	+ 5,133
Leeds City	„ 5	12,824	14,915	+ 2,091	½	11,336	+ 1,621
Leicester Corporation	„ 12	4,101	5,847	+ 1,746	..	..	..
Leyton U.D. Council	„ 10	1,858	2,807	+ 949	2	5,415	+ 1,461
Liverpool Corporation	„ 5	17,784	21,354	+ 3,570	13½	273,663	+ 46,862
Llandudno & Colwyn Bay	„ 4	537	346	— 191	18	5,368	+ 790
London County Council	„ 9	55,333	74,928	+ 19,595	1½	95,464	+ 23,684
Maidstone Corporation	„ 10	262	321	+ 59	1½	714	+ 75
Manchester Corporation	„ 5	24,664	28,065	+ 3,401	1	1,391,998	+ 253,605
Newcastle-on-Tyne Cor.	„ 5	8,788	8,607	— 181	1	8,607	— 181
Northampton Cor.	„ 4	779	619	— 160	½	619	— 160
Nottingham Corporation	„ 10	4,948	6,731	+ 1,783	2	9,532	+ 1,261
Oldham Corporation	Mar. 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation	Apr. 10	1,164	1,515	+ 351	1½	2,112	—
Rhondda Tramways	Mar. 20	1,633	2,150	+ 517	11	23,210	+ 5,603
Rotherham Corporation	Apr. 9	2,124	2,142	+ 18	1½	2,633	— 187
Sheffield Corporation	„ 6	13,883	16,725	+ 2,842	1½	28,012	+ 5,224
Southampton Cor.	„ 9	2,364	2,578	+ 214	1½	3,339	— 280
Southend-on-Sea Cor.	„ 9	691	1,372	+ 681	1	1,742	+ 567
South Shields Cor.	Mar. 15	1,014	1,203	+ 189	50	57,737	+ 9,276
Sunderland Corporation	Apr. 13	1,981	2,731	+ 750	2	5,229	+ 1,068
Swindon Corporation	Mar. 26	301	264	— 37	51½	15,687	+ 1,467
Torquay Tramways	Apr 3	979	830	— 149	13	9,697	+ 429
Tyneside Trys. & Trmrds.	Mar 26	1,012	884	— 127	13	10,073	— 342
Wallasey Corporation	Apr. 5	1,846	2,110	+ 264	½	1,626	— 49
Walsall Corporation	„ 5	1,451	1,315	— 136	½	997	— 318
Walthamstow U.D. Coun.	„ 12	1,221	1,646	+ 425	2	3,172	+ 961
Warrington Corporation	Feb. 20	725	851	+ 126	51	39,949	+ 8,793
West Ham Corporation	Apr. 3	4,184	4,884	+ 700	52	242,848	+ 49,423
Wigan Corporation	Jan. 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Apr. 1	£53,346	£61,541	13	£736,000	+ £31,093
Auckland (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Feb. 2	3,573	3,602	44	39,080	+ 2,196
Brazilian Traction (Mlrs.)	Feb.	7,315,000	7,972,000	8	16,494,000	+ 1,342,000
Brisbane	Feb.	32,009	34,380	8	72,955	+ 6,446
British Columbia $	Feb.	501,150	645,415	34	4,740,999	+ 756,620
Buenos Aires Lacroze	Mar.	42,647	47,370	39	390,579	+ 44,158
Burmah Tram. & Light Rs.	Feb.	22,985	35,926	30	250,730	+ 66,495
Calcutta Rs.	Apr 5	70,023	85,553	13½	1,175,440	+ 184,543
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Mar.	5,316	2,400	13	8,406	— 4,952
Cordoba	Jan.	12,844	13,942	44	145,654	+ 10,915
East India	Mar.	1,729	2,016	34	15,628	+ 5,132
Hong Kong $	Feb. 22	13,020	13,602	8	114,492	+ 7,154
Kalgoorlie	Nov.	2,641	2,933	48	30,838	+ 1,274
La Plata	Mar.	5,348	6,592	13	18,019	+ 1,971
Lima	Jan.	43,561	45,362	4	45,362	+ 1,801
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Feb. 28	33,553	35,254	6	166,609	+ 17,415
Manaos Rs.	Aug.	150,657	132,507	34	1,152,686	+ 83,959
Manila $	Jan.	167,000	231,585	4	231,585	+ 64,585
Montevideo	Mar.	36,659	41,070	21	190,891	+ 18,558
Para	Feb.	22,198	23,248	13	71,563	+ 1,990
Pernambuco	Apr. 6	4,616	5,811	13½	73,533	+ 8,533
Peruvian $	Feb.	925,410	948,470	34	7,973,835	— 229,195
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Mar.	5,955	7,533	13	19,600	+ 2,622
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore $	Mar. 1	14,640	15,489	9	145,471	+ 26,179
Toronto $	Feb.	981,933	1,015,797	8	2,122,637	+ 72,385
Winnipeg $	Feb.	298,899	371,162	8	761,701	+ 128,160

WANTED.

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THE
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SATURDAY, APRIL 26, 1919.

A DANGER FOR MUNICIPAL EMPLOYEES.

Democracy has entered into industrial management with a rush, and in the hurry a certain amount of confusion is already evident. It is too late in the day to raise the question whether or not the workers are entitled to have a voice in the management of the industries which employ them. That question has been answered emphatically in the affirmative, and the problem before both workers and employers is how to adjust their relative powers. The problem bristles with difficulties. On the one hand, it must be remembered that owners of works and other employing enterprises still have the right to protect their own property from waste, destruction, or inefficiency. On the other hand, there are many industries in which the workers are wholly unorganised and therefore unable to depute their right to a voice in management to any body of individuals. It will take years of debate, and perhaps serious struggle, before adjustment can be attained on these lines; it is even questionable if that is the road to ultimate peace and justice. The National Industrial Councils in process of organisation have at least the negative merit of acting as conductors of reforming energy and labour discontent. That they will have other good effects can scarcely be doubted. Labour, however, is not wholly assured that the Industrial Councils will satisfy its desires, and some of its leading spirits are moving towards other goals. The other day a Labour member of Glasgow Town Council tabled a motion demanding that the employees of departments should have the right to representation on the Departmental Committees controlling the department employing them. On the face of it, the demand is preposterous, and it is illegal, but the claim is symptomatic. Everyone knows that a contract with a municipality becomes void if it can be proved that a member of Council voting on the subject has a financial interest in the contract. The law is quite explicit on the point. The members of a local authority are elected to conduct the business of the community, in the interests of the community, without regard to any private interests whatsoever. Employment is based upon a definite contract between worker and employer: the employee engages to work so many hours for so much pay, and the employer engages to pay so much money for so many hours of work. Yet, according to this Labour proposal, parties directly interested in the contract are to debate and vote upon its terms. If Labour leaders take that line, they will do their clients a double disservice: they will place them in direct antagonism to the community, and show them as promoters of municipal corruption. The viper of human greed continually reappears. When the local contractor and merchant were ruled out from using their public office to promote directly their private interests, it was fondly imagined that the serpent had been banished from the municipal area, but, if this movement gathers force, the evil will come back.

L.C.C. TRAMWAY MATTERS.

TYPE OF LONDON TRAMWAY CAR.

At the last meeting of the London County Council, Mr. J. D. Gilbert, M.P., asked the Chairman of the Highways Committee if the Committee had considered whether the present tramway car was the best and most economical type and the most suitable for working, and whether before more cars were ordered the matter would be gone into. Mr. W. J. Squires replied that the present type had been chosen after careful study of the cars in use in many other cities. In view of the traffic conditions in London it was still considered the best type, and there was no intention to alter it. Mr Gilbert asked how long ago the special type had been selected, and Mr. Squires replied that he must have notice of the question.

WAR WAGES—ELECTRICAL BRANCH, TRAMWAYS DEPARTMENT.

On February 18th last the Council agreed to the reference to arbitration under the Conciliation Act, 1896, of the application made on behalf of certain of the technical staff of the electricity supply and tramways undertaking for increased war bonus and war wages. The award, which has now been made, provides for an increase in salaries or wages by 20 per cent., plus £90 a year as from March 31st, 1918. The increase is in lieu of a war bonus, payable under the Council's scheme, including a percentage increase on salary agreed to by the Council on March 4th, 1919, and a special allowance of £50 a year payable to certain assistants in the electrical branch of the tramways department. Hereafter the percentage increase will not be taken into account in calculating contributions to the superannuation and provident funds. The question of what portion of the staff actually comes within the terms of the award is under consideration. It is estimated, however, that the maximum cost of applying the award to the tramways department will be £900 for the financial year 1918-19, and £300 a year subsequently. The Finance Committee approved the estimates and the award was agreed to.

The next meeting of the Council will be held on May 13th.

TRAMWAYS AND LIGHT RAILWAYS ASSOCIATION.

EVIDENCE IN FAVOUR OF DECIMAL COINAGE.

The *Journal* for April contains the terms of the agreement arrived at on March 20th between representatives of the Municipal Tramways Conference, the Tramways and Light Railways Association, and the National Transport Workers' Federation, and the award on the application by the Electrical Power Engineers' Association to municipal and other electrical undertakings in Great Britain, with a schedule giving a list of the authorities and undertakings affected; also the results of arbitrations affecting electricity undertakings in London and district, and engineering and foundry trades.

The evidence given by Mr. W. L. Madgen, who was nominated to submit evidence to the Royal Commission on Decimal Coinage on behalf of the Tramways and Light Railways Association, occupies some ten pages of the issue. Mr. Madgen stated that those who are responsible for some of the undertakings which are members of the Association had taken considerable interest in the subject. The decimal system would be advantageous. It would save labour in working out the receipts and expenses per car mile and other statistics, which are an important feature of transport work. The decimal system of coinage would be much better for the purpose than the existing system. Payment of wages in decimal coinage would be a consistent step, which would be helpful in account keeping. The only practical questions appear to be the fixing of the value of coins for common use, and the suitability for trade purposes. So far as the tramway industry was concerned, he thought that there would be little disturbance or difficulty caused by the introduction of the decimal system. The five mil coin in substitution for the existing coins would confer benefits on both the travelling public and the tramway industry.

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TRADE UNION CUSTOMS RESTORED.

By the Munitions of War Act, 1915, the Ministry of Munitions was empowered to operate all engineering and other works under its control free from any restrictions which trade customs or rights imposed. According to the rules of the Amalgamated Society of Engineers, for example, only members of the Society could be employed in the workshops. Other trade unions had similar rules, and workshop practices were regulated in numerous details, the ostensible object of all these restrictions being to conserve the interests of the workers normally engaged in the different industries affected. But while on the one hand the demands of the fighting forces had denuded the works of skilled men, on the other hand the needs of the Army for supplies of munitions of all kinds, which only the engineering industries could supply, had enormously increased. In such circumstances, unskilled labour and women had to be called in, and everything that obstructed the most rapid production possible pushed aside. On the undertaking of Ministers that their rights and privileges would be restored after the war, the trade unions waived their claims, trade union rules were abrogated, and all restrictions upon output removed, women and girls being largely employed upon what had formerly been regarded as he work of skilled men.

On Tuesday, April 15, the Minister of Labour introduced into the House of Commons a Bill, to be hereafter named the "Restoration of Pre-War Practices Act, 1919," which is the fulfilment of the Ministerial pledge to the trade unions. The text of the Bill has now been published, and though the measure is short, it seems to contain a good deal of material for prolonged controversy. The Bill mainly aims at providing that:

(1) Owners of establishments wherein trade practices had been departed from during the war shall restore, or permit the restoration of such trade practices, within a month of the date fixed by the Bill, and continue to maintain that condition for a year. (2) Into establishments employing workers to whom the trade practices apply, though formerly free from obligation to trade union rules, these practices will be introduced. (3) A majority of the employees shall decide whether or not the trade customs and practices shall be resumed. (4) The owner of an establishment may object, and his objection is to be referred to a special tribunal. (5) Refusal to comply with the provisions of the Bill involves a fine not exceeding £25 for each day or part of a day during which the offence continues.

LIGHT RAILWAY COMMISSIONERS' REPORT.

The report of the Light Railway Commissioners (Mr. H. A. Steward and Mr. A. D. Erskine) for 1918 shows that eight orders were submitted by the Commission to the Board of Trade. Of these, four have now been confirmed, and four are still under consideration. Only one of these orders authorises fresh construction, and the length of line in this case is 6½ miles, the estimated cost being £63,000.

Since the passing of the Light Railways Act, 1896, the applications for orders numbered 687, including 124 applications for amended orders. The details of these applications and the results are given in appendices to the report. The total mileage of all classes of lines applied for is 5,051. The orders confirmed up to December 31st, 1918, authorised the construction of 2,101 miles. About 900 miles have been actually constructed, of which 550 are on lands acquired, and about 350 on roads.

With respect to co-operation of road traffic, the Commissioners remark that it is now generally recognised that there are now many districts where increase of population and the development of productive industry are likely to follow upon better economic facilities of transport, but it may be advisable to add that other facilities of transport than by rail, whether by road or by water, may in some cases, as their experience indicates, be more suitable. The tendency in some quarters to regard various means of transport as competitive with, rather than as complementary to, each other the Commissioners suggest may be aggravated by treating them separately in point of procedure rather than by referring them to the authority of the different bodies. It would in many ways, the report states, be an advantage if matters relating to all secondary means of local transport could be referred to the same bodies or Government departments for the purpose of consideration and control, so that a measure of uniformity in practice would be obtained. No dividing line can be clearly drawn between secondary means of transport and such service as main lines afford.

The Commissioners express their great sense of loss sustained by the retirement in October and subsequent death in November, 1918, of Mr. Gathorne-Hardy, who had been Chairman of the Commission since 1905.

Important Development at Birmingham.—Acting in conjunction with the Electricity Supply Committee, the Birmingham Corporation Tramways Committee is making arrangements for connecting the district of Rednal with the city tramway system. Electricity for power and lighting, to meet the needs of the district, the population of which is about 50,000, is to be supplied from a sub-station, the site for which has been selected, and constitutes an area of 1,000 yards in Maryvale Road, Bournville. Power for the new tramway system will be supplied from Bournville.

EFFECTS OF CONCESSIONS TO EMPLOYEES.

Birmingham Tramways Department has reported to the Tramways Committee that the concessions now granted to the workers involve an increase in the costs of operating amounting to over £160,000 per annum. The Finance Committee, who have examined the proposals and the bill of costs, state that the increase of £160,000 referred to, and the probability of further serious expenditure, must involve an immediate increase in the tramway fares.

A sub-committee of Dundee Town Council Tramways Committee has reported that, owing to the increase in employees' wages involved in the recent new agreement, estimated to amount to about £12,000 per annum, and, further, owing to the additional outlay of about £2,500 on streets, it would be necessary to adopt some means whereby the increase might be met. The Tramways Committee has accordingly recommended that the tram fares should be raised by about a halfpenny on all the longer distance routes. Workmen's fares are to remain the same, and through tickets are to be abolished. The Committee points out that the wages bill for the week ending April 12th was £971, as compared with £371 in the corresponding week of 1914.

The Tramways Committee has presented a report to Croydon Town Council stating that the estimated cost of carrying into effect the new terms of agreement with the employees was £28,000 a year. The Committee submitted a revised list of fares and stages by which it was hoped the increased expenditure would be partially met. The Council refused to accept the report, and referred it back for further consideration.

Kirkcaldy Town Council Tramways Committee has intimated that, in view of the increased cost of operation caused by the high cost of materials and increases in wages, tramway fares must be raised by at least 100 per cent. Decision has been delayed, however, till the close of the financial year on May 15th.

Having obtained the sanction of the Board of Trade, the Bath Electric Tramways Company have raised their fares on most routes about 50 per cent., the alteration taking effect on April 17th. Wages paid by the company have increased £11,000 in the past twelve months.

NEW AND PROSPECTIVE WORK.

West Riding Standing Joint Committee propose to purchase a motor lorry at a cost of about £1,100.

Deeside District Committee of Aberdeenshire County Council have forwarded to the Rural Transport (Scotland) Committee claims which they support for a scheme for a light railway from Ballater to Braemar.

At a recent meeting of Kirkcaldy Town Council Tramways Committee, an estimate of the cost of the proposed new generating station was submitted, showing that the cost would be £290,000. The Town Clerk and the Burgh Electrical Engineer were appointed a deputation to the Local Government Board, to consult that authority as to what arrangements should be made to meet the financial obligation imposed by the scheme

The Tramways Committee of Dundee Town Council has accepted a contract for ten new cars at £306 each, and ten sets of equipment at £580.

MISCELLANEOUS NEWS AND NOTES.

Bradford Tramways Committee propose to order 52 tramcar motors in addition to the 52 recently ordered.

Women Conductors have now been all replaced by men on the Croydon Corporation tramways.

Tramcar in the Dark.—On a Sunday night, the last tramcar from Howth to Dublin ran into two horses, killing one outright and injuring the other so that it had to be shot. No damage was suffered by the tramcar, and none of the passengers was injured.

Edinburgh Fares.—The Board of Trade has declined to sanction the increase in fares from 1d. to 1½d., pending the receipt of information regarding the loss which the National Award to tramway employees has entailed.

Increased Cost of Ambulance Running.—Owing to increased wages, etc., the Metropolitan Asylums Board are charging Poor Law Guardians 1s. a mile instead of 9d. for the hire of motor ambulances.

A Glasgow Deputation.—A sub-committee appointed by the Glasgow Corporation to enquire into new and improved vehicles and plant for cleansing purposes have now decided to send a deputation to inspect the haulage plant and appliances in operation in London, Birmingham, and Sheffield.

Municipal Tramways Conference.—Mr. W. J. Squires, chairman of the Highways Committee, and Lt.-Col. A. C. H. Kennard have been appointed representatives of the London County Council at the conference of the Municipal Tramways Association, to be held in September next.

Unhealthy Overcrowding in Cars.—Bristol Health Committee, at a meeting held on April 15th, discussed the report of the Medical Officer of Health, advising that, as the death rate was becoming normal, the restrictions on public performances and overcrowding in tramcars should now be taken off. The Committee agreed, however, that overcrowding in the cars was dangerous to health, and decided that the Town Clerk should draft a letter to the Watch Committee in that sense.

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Great Orme's Head Cable Resumes.—Owing to the refusal of the Ministry of Munitions to grant a certificate enabling the company to obtain a new cable, the cable tramway from Great Orme's Head to Llandudno had to be closed last year. Now, however, the new cable has been installed, and the tramway service has been resumed.

The Institution of Electrical Engineers. On Thursday, May 1st, Dr. C. Chree, LL.D., F.R.S., will lecture on "Magnetic Stones" before the Institution of Electrical Engineers. The meeting will be held at the Institution of Civil Engineers, Great George Street, S.W., at 6 p.m.

Tramcar Housing Fable. At the last meeting of the Ilkley Urban District Council, the Chairman of the Moors and Parks Committee emphatically denied the statement that had appeared in the press to the effect that owing to the house famine in Bradford the Shipley and Ilkley moors were occupied by colonies of people living in tramway cars.

Institution of Municipal and County Engineers. The annual meeting of this Institution will be held in Birmingham on June 26th, 27th and 28th, under the presidency of Mr. Henry E. Stilgoe. Among the subjects to be discussed are "Housing and Town Planning" and "Road Construction." Visits to various works in Birmingham and in the suburbs will be arranged.

Standardisation Wanted. One wagon company states that it has 223 different patterns of axle boxes and 402 different patterns of brasses. Mr W. M. Acworth, in a letter to the *Times*, asks what would the Society of Motor Manufacturers or the Engineering Standards Committee have to say as to the economy of the continuance of this state of affairs.

Cost of a Car Collision. The sequel to a collision between two cars in Peckham came up in Greenwich County Court last week. A woman who had been a passenger in one of the colliding cars brought an action against the London County Council, claiming damages for shock and injuries received. Judgment was given for £150 damages and costs.

Saving by Motor Transport. The Electricity Committee of the Luton Town Council have had a report that £400 yearly could be saved by removing the clinkers from the generating station by motor, and accordingly the Committee recommend the purchase of a 3½-ton electric vehicle from the Edison Accumulators, Ltd., at a cost of £1,607.

Control by Municipal Employees. Bailie Wheatley, a Labour member of Glasgow Town Council, has tabled a motion requiring that each standing committee of the Council shall include a number of members to be elected annually by the employees of the department controlled by that committee, such members to form at least one-third of the whole, and to have equal powers with the other members.

Motor Buses and Street Lamps. The Camberwell Borough Council have had correspondence with the Commissioner of Police as to street lamps said to project from the footways and interfere with traffic. The Council, however, contend that any difficulties are caused through the manner in which the vehicles are constructed, and suggest that vehicles with top-decks overhanging the wheels should not be licensed by the police.

Earlier Easter Holidays.—In view of the difficulties of the railway companies in providing trains for the conveyance of traffic, employers of labour are urged by the Railway Executive Committee to arrange holiday programmes for their staffs so as to avoid an undue proportion travelling in July and August. The suggestion is made that those who are able to do so should take their holidays in May and June, and that Tuesdays, Wednesdays, Thursdays and Fridays should be used for travelling.

Lanarkshire Tramway Strike Continues.—Up till the present the strike, reported in our last issue, on the Lanarkshire tramways still continues. The company management has issued a poster explaining to the public the cause of the dispute, and asking for general forbearance in regard to inconvenience until the dispute has been settled. Public opinion in the district, however, is in favour of the strikers, and the employees have added to their demand that the dismissed woman driver be reinstated, further claims, including an eight-hour day and double pay for Sunday duty.

Civilian Flying.—The ban on civilian flying will be raised on May 1st, and the Air Ministry on Friday published some details of the aerial routes which it is thought desirable to use at first. These are described as the trunk aerial routes, and have been chosen with reference to the situation of existing aerodromes and military demands. An attempt has been made to establish direct communication between London and Ireland, and London and the North, and also to cater for some of the more important centres which lie along the routes. The suggested routes are as follows: London-Scotland, London-Dublin, London-Manchester-Belfast, a Continental route, a Dutch route, London-Plymouth and London-Bristol.

No Complaints from Soldiers.—The *San Diego Electric Railway News* reports the remark of a returned soldier who overheard the grumble of a passenger on a car the other day. Said the soldier: "You people would never kick against overcrowded street cars if you had been where I have been." Another soldier remarked: "Before us was a very long string of box cars labelled 'hommes, 40; chevaux, 20.' Now I was one of the 40 hommes on one of these proverbial sardine cans. Twelve miles of jolting added nothing to our joy, although it served to shake us into a more perfect fit than before. Never more will I complain of a five o'clock rush on a street car."

Petrol Control Board. In reply to a question by Mr. Gilbert in the House of Commons, Mr. Bridgeman said that the number of the staff now employed by the Petrol Control Department was 341. The cost of the Department, including accommodation, in 1918 was about £54,000, while the present expenditure was at the rate of £42,000 a year.

Light Railways and Agriculture.—The Light Railway Commissioners, in their report, specially refer to a proposed light railway from Longridge to Hellifield, of a length of 24 miles, indicating that approval of the project depends largely upon proof that the railway will effect improvement in the agricultural resources of the district. The estimate of capital expenditure for the Longridge-Hellifield line is about £233,856, and the promoters have lodged an application with the Board of Agriculture for their support in accordance with the conditions stated by the Light Railway Commissioners.

Map of Greater London. A large development map of Greater London, which has been prepared by the London Society, was recently exhibited at King's College. This map, on which the Society has spent £1,000 and three years of work, shows all the existing main and arterial roads and those proposed by the Traffic Branches of the Board of Trade and the London Society. The map has been reproduced by Messrs. Edward Stanford, Ltd., of 12, Long Acre, W.C.2, and for the purpose of reproduction it has been divided into sixteen sheets, each 14½ in. by 23½ in., and each sheet is sold separately at 3s. The whole map may be had folded in portfolio for £2.

Alleged Unfairness to Omnibuses.—Hull Watch Committee considered, at a recent meeting, a resolution passed by Anlaby ratepayers, protesting against the Chief Constable prohibiting passengers standing in the Anlaby motor omnibus. They suggested that this was unfair so long as the trams were allowed to carry passengers in excess of the regulation limits. Alderman Pybus stated that the buses were being treated on the same terms as the trams. If half-a-dozen people jumped on to the front of a tramcar they would be interfered with. The complaint of the authorities referred to the overcrowding of the seats close to the driver. "And," added the Chief Constable, "it applies also to the back step."

Tramcars for Revellers. Early in the year a "Victory Ball" was held in Glasgow in aid of "Jock's Box," and the management had the enterprise to provide tramcars to take the dancers home in the early hours of the morning. The great convenience of the expedient having thus become evident, it is now quite the thing for organisations holding high revel till far on in the night to charter tramcars to carry their guests homeward. Promoters of picnic parties have also realised the value of the tramcars as conveyances, and the bookings for that purpose are reported to be numerous. Saturday picnics by tram would be immensely popular, but at present the adventure is quite impossible.

Increases in L.C.C. South London Fares. On Sunday, April 27, the following increases in fares on the London County Council Tramways south of the Thames, will take effect: Penny stages will average 1½ miles, the stages being divided into two sections. Passengers can travel any two consecutive sections for a penny, four sections for 2d., and six sections for 3d., the maximum ordinary fare remaining at 4d. Workmen's fares are also increased. For 2d. return the passenger can make a total journey of four miles, for 3d. return six miles; for 4d. return eight miles; and for 5d. return any further distance. Transfer facilities will only be given with the 5d. return ticket.

Technical Inspection Association.—This Association has recently been formed, and will make a strong appeal to many technical men throughout the Empire who are interested in inspection work. It is the outcome of the Ministry of Munitions Department, and has been formed to maintain intercourse and promote mutual assistance among its members, and to conserve for the national use the experiences brought together by the war, and generally to develop the progress and standardisation for inspection in the engineering, chemical and allied industries. Owing to the stoppage of war work, the services of a large number of men possessing high technical qualifications, who have spent several years on the inspection of Government contracts, are now available. The honorary secretary will be glad to supply particulars to any who may be interested. Communications should be addressed to the Technical Inspection Association, Hotel Metropole, Northumberland Avenue, S.W.1.

Transport Bill in Committee. At the last sitting of the Standing Committee on the Ministry of Ways and Communications Bill before the Easter recess, Clause 3 (power to control temporarily railways, etc.) was submitted for consideration. A few minor amendments were made on the original draft, specially affecting privately owned wagons, canal barges, etc., which are now excluded from the operation of the Bill, compulsory acquisition of land, vested interests of employees of undertakings put under the control of the proposed Ministry, and charges in rates, fares, etc. In regard to the question affecting land, the Government has consented to substitute "easement" for "land," by which the fears of undertakings lest land acquired for their own development should be permanently alienated from them, are removed. Upon the right of the Minister to control rates, fares, etc., the Home Secretary has undertaken to submit an amendment which will meet the objections of traders to the clause. The Committee resumes its work next week.

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FINANCIAL.

Potteries Electric Traction Co., Ltd.—A dividend is announced of 5 per cent. per annum on the ordinary shares.

Tynemouth and District Electric Traction Co.—A dividend is announced on the ordinary shares at 8 per cent., £1,000 is carried to reserve, and £1,940 forward.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended April 23rd, including the Easter holidays, amounted to £82,637, an increase of £28,384 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1st (the commencement of the financial year) to April 23rd (three weeks and two days) the total receipts were £253,209, an increase of £71,852 on the corresponding period of 1918.

Manchester Tramways Estimates—The general manager of Manchester Corporation tramways (Mr. J. M. McElroy) has submitted his annual estimates for the year ended March 31st, 1920. The traffic revenue is estimated at £1,480,000, and miscellaneous revenue, including motor omnibuses and parcels traffic, £9,800, making a total of £1,489,000, an increase of £120,549 on last year's figures. The expenditure is estimated at £1,377,910. This amount includes the estimated cost of £70,000 by granting a 48-hour week to the employees, the war bonuses which have now been merged in the operating account, and £90,000 for the renewals fund. The estimated balance is £111,890, which is to be allocated to the City Fund in aid of the rates. The estimates prepared at the beginning of the last financial year showed a deficiency in the revenue of £181,753, which had to be met by the adoption of an increased scale of fares. This scale was put into operation about the middle of the year, and the total revenue reached £1,359,451, an increase of £251,287 on the previous year's revenue. It is interesting to note, by way of comparison, that for the year ended March 31st, 1915, the revenue was £887,763; the passengers carried were 202,768,420; and for the last financial year the passengers were 253,930,220. After the payment of £111,890 to the City Fund, equivalent to 5 per cent. on the capital expenditure, the percentage fixed by the Council, the sum of £109,452 was carried to the renewals account. Wages now being paid show an increase of about £400,000 compared with pre-war years, the increase being about 117 per cent. The renewals fund now stands at £429,451. The total capital expenditure on March 31st, 1919, was £2,237,827, and the outstanding debt £1,458,814.

CONTRACTS AND ORDERS.

The Bridgeport Brass Company has an order for phono-electric trolley wire from Glasgow tramways department.

Thermit, Limited, are supplying material for 600 Thermit-welded joints to Bradford Tramways Committee.

Hadfields, Ltd:, have received an order from Dover Corporation Tramways Committee for points and crossings.

Northallerton Rural District Council have asked the Surveyor to look out for a suitable tractor for hauling road material.

Sheffield Corporation Tramways Committee recommend the sale of a D.F.P. two-seater motor car and the purchase of a new car at an estimated difference of £70.

Walter Scott, Ltd., are supplying 800 tons of high silicon steel rails to Bradford Corporation tramways at £18 12s. 6d. per ton; 150 tons are to be treated by the Sandberg sorbitic steel process.

Edison Accumulator Company, Ltd., are supplying three electric vehicles at £1,304 each to Taunton Town Council. One vehicle will be provided with an interchangeable body at an extra cost of £300.

London County Council.—Six four-ton petrol lorries are required by the London County Council tramways. Applications to the General Manager, London County Council Tramways, 23, Belvedere Road, Lambeth, S.E.1.

PERSONAL.

Mr. Walter Farrar, deputy borough surveyor of Todmorden, has been appointed assistant to the borough engineer of Wigan. Over fifty applications were received for the position.

The many friends of **Mr. J. M. McElroy,** general manager of the Manchester Corporation Tramways, will be glad to learn that he has recovered from his recent illness and resumed his usual duties last week.

THE

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LIMITED.

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This Company, with a Capital of £5,000,000, has been formed to consolidate under one direction and management the various interests of the following companies, in all of which a predominating control exists:—

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TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C. ..	Apr. 15	460	530	+ 70	2	1,111	—
Aberdeen Corporation ..	„ 16	2, 60	2,892	+ 732	46	119,629	+ 19,599
Ayr Corporation ..	„ 17	364	544	+ 180	48	27,440	+ 5,612
Birkenhead Corporation	„ 20	1,876	2,398	+ 522	2⅔	6,729	+ 955
Blackburn „ ..	„ 9	1,441	2,086	+ 645	2¼	4,355	+ 361
Bradford Corporation ..	„ 12	7,665	10,203	+ 2,538	2	17,944	+ 2,121
Burnley Corporation .	„ 19	1,863	3,681	+ 1,818	..	..	..
Burton-on-Trent Cor. ..	„ 20	385	499	+ 114	3	1,246	+ 157
Bury Corporation ..	„ 20	1,554	3,052	+ 1,418	2⅔	7,074	+ 2,111
Chatham & District ..	„ 10	1,168	1,418	+ 250	14	17,442	+ 651
Cork Electric	„ 10	623	619	— 4	14	7,653	— 873
Derby Corporation ..	„ 19	1,284	1,709	+ 425	3	4,520	+ 499
Dundee City	„ 16	1,606	2,201	+ 595	48	94,743	+ 19,233
East Ham Corporation ..	„ 19	1,187	1,948	+ 761	2⅔	5,044	+ 1,629
Glasgow Corporation ..	„ 19	28,263	30,938	+ 2,675	46½	1,326,825	+ 97,966
Glossop (U.E. Sup. Co.) ..	„ 19	160	264	+ 104	16	3,467	+ 609
Halifax Corporation ..	„ 15	2,204	3,037	+ 833	2½	6,492	+ 599
do. Motor Buses ..	„ 15	51	73	+ 22	2½	154	+ 22
Huddersfield Corporation	„ 19	3,062	4,633	+ 1,571	3	12,890	+ 2,254
Ilford U.D. Council ..	„ 19	876	1,225	+ 349	3	3,164	+ 688
Ipswich Corporation ..	„ 19	602	901	+ 299	3	2,185	+ 413
Isle of Thanet ..	„ 19	177	978	+ 801	28⅔	10,114	+ 4,899
Kilmarnock Corporation	„ 19	223	286	+ 63	48½	12,982	+ 2,773
Lanarkshire	„ 3	3,732	3,595	— 137	13	48,161	+ 5,132
Leeds City	„ 19	10,736	16,187	+ 5,451	3	42,859	+ 13,012
Leicester Corporation ..	„ 19	4,211	5,776	+ 1,565	..	..	..
Leyton U.D. Council ..	„ 17	1,819	2,903	+ 1,084	3	8,318	+ 2,545
Liverpool Corporation ..	„ 19	16,657	22,520	+ 5,863	15½	318,515	+ 58,320
Llandudno & Colwyn Bay	„ 4	537	346	— 191	18	5,368	+ 700
London County Council ..	„ 23	54,253	82,637	+ 28,384	3⅔	253,209	+ 71,852
Maidstone Corporation ..	„ 17	231	321	+ 90	2⅔	1,036	+ 164
Manchester Corporation	„ 12	23,311	29,419	+ 6,108	2	57,485	+ 13,965
Newcastle-on-Tyne Cor.	„ 19	8,460	9,289	+ 829	3	26,856	+ 3,546
Northampton Cor. ..	„ 4	779	619	— 160	½	619	— 160
Nottingham Corporation	„ 17	5,156	7,231	+ 2,075	3	16,763	+ 3,335
Oldham Corporation ..	Mar. 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation ..	Apr. 17	1,157	1,551	+ 394	2⅔	3,662	—
Rhondda Tramways ..	Mar. 20	1,633	2,150	+ 517	11	23,210	+ 5,603
Rotherham Corporation	Apr. 16	1,954	2,165	+ 211	2⅔	4,789	+ 13
Sheffield Corporation ..	„ 20	12,688	17,215	+ 4,527	3⅔	61,931	+ 13,737
Southampton Cor. ..	„ 16	2,274	2,532	+ 258	2⅔	5,871	— 22
Southend-on-Sea Cor. ..	„ 9	691	1,372	+ 681	1	1,742	+ 567
South Shields Cor. ..	„ 12	1,031	1,342	+ 311	3	2,276	+ 386
Sunderland Corporation..	„ 20	2,038	2,974	+ 936	3	8,203	+ 2,004
Swindon Corporation ..	Mar. 26	301	264	— 37	51⅔	15,687	+ 1,467
Torquay Tramways ..	Apr. 10	796	919	+ 123	14	10,616	+ 552
Tyneside Trys. & Trmrds.	„ 2	1,116	884	— 232	14	10,958	— 573
Wallasey Corporation ..	„ 19	1,481	2,477	+ 996	2⅔	6,350	+ 1,683
Walsall Corporation ..	„ 5	1,451	1,315	— 136	⅔	997	— 313
Walthamstow U.D. Coun.	„ 19	1,165	1,884	+ 719	3	5,056	+ 1,672
Warrington Corporation	Feb. 20	725	851	+ 126	51	39,949	+ 8,793
West Ham Corporation	Apr. 17	3,845	5,334	+ 1,489	2⅔	12,531	+ 2,433
Wigan Corporation .	Jan. 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Apr. 22	£59,417	£55,406	16	£918,584	+ £38,631
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,852
Ballarat and Bendigo (4 wks)	Feb. 2	3,573	3,602	44	39,080	+ 2,196
Brazilian Traction (Mlrs.)	Feb.	7,315,000	7,972,000	8	16,494,000	+ 1,342,000
Brisbane	Feb.	32,009	34,320	8	72,955	+ 6,446
British Columbia .. $	Feb.	501,150	645,415	34	4,740,999	+ 756,620
Buenos Aires Lacroze ..	Mar.	42,647	47,370	39	390,579	+ 44,158
Burmah Tram. & Light Rs.	Mar. 31	27,906	38,440	34	289,170	+ 77,029
Calcutta .. .. Rs.	Apr 19	73,362	79,416	15½	1,330,247	+ 192,391
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Mar.	5,316	2,400	13	8,406	— 4,952
Cordoba	Jan.	12,844	13,942	44	145,654	+ 10,915
East India	Mar.	1,729	2,016	34	15,628	+ 5,132
Hong Kong.. .. $	Mar. 1	21,068	15,993	9	130,485	+ 2,079
Kalgoorlie	Nov.	2,641	2,933	48	30,838	+ 1,274
La Plata	Mar.	5,348	6,592	13	18,019	+ 1,971
Lima	Jan.	43,561	45,362	4	45,362	+ 1,801
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Feb. 28	33,553	35,254	6	166,609	+ 17,415
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	+ 83,959
Manila .. .. $	Jan.	167,000	231,585	4	231,585	+ 64,585
Montevideo	Mar.	36,659	41,070	21	190,891	+ 18,558
Para	Mar.	24,848	26,022	17	97,585	+ 3,164
Pernambuco	Apr. 26	4,441	5,448	15½	84,417	+ 10,480
Peruvian .. .. $	Feb.	925,410	943,470	34	7,973,835	— 229,195
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Mar.	5,955	7,533	13	19,600	+ 2,622
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore .. .. $	Mar. 1	14,640	15,489	9	145,471	+ 26,179
Toronto .. .. $	Feb.	981,933	1,015,797	8	2,122,637	+ 72,385
Winnipeg .. .. $	Feb.	298,899	371,162	8	761,761	+ 128,160

WANTED.

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SATURDAY, MAY 3, 1919.

AN ACT OF BRIGANDAGE.

UP till late in the last century, travellers in the wilder districts of south-eastern Europe were frequently taken prisoner and held to ransom. The ordinary British citizen not infrequently felt disposed to regard the matter as a practical joke in very bad taste, and learned with a shock of surprise that the brigands had to be treated seriously and the ransom paid. We comforted ourselves with the reflection, however, that such a mode of conduct was possible only to those dim and distant, half-civilised populations living on the outskirts of European civilisation, though some few episodes of the late war have conveyed the impression that the proverb, "Civilisation is only skin deep," is more than half true. Still, we have said with Carlyle, "God bless the narrow seas," and knew that the spirit of brigandage had no lodgment in the breasts of British citizens. In this faith, our legislators have laid plans for reconstruction. Fair play, common sense, and sweet reasonableness are the only means by which the differences between employers and employed, and the interests of the individual and the community, were to be adjusted and reconciled. Some events have occurred recently, however, which may well give a serious shock to our self-complacency. The working classes especially seem to have more faith in the gospel of force than is quite becoming in the citizens of a civilised community. The latest, and admittedly the most flagrant, example up to date has occurred in Sheffield. The tramwaymen employed by Sheffield Corporation were dissatisfied with the interpretation which had been put upon the new national agreement by the tramway management. Accordingly, they called a meeting to discuss the questions raised, on the morning of Sunday, April 27, and requested the general manager of the tramways to attend and discuss the matter with them. So far so good. But before the time fixed for the attendance of Mr. Fearnley, the tramwaymen passed a resolution, which practically implied that all present would refuse to begin work until the manager had satisfied their demands. Suspecting no evil, Mr. Fearnley entered the meeting, and at the invitation of the chairman explained the reading of the national agreement which had been accepted by the Sheffield Corporation Tramways Committee. Then he was told that the tramwaymen totally dissented from that interpretation, and that not a man would start work until he agreed to their terms. The men, as a Sheffield pressman put it, "held a pistol to his head, demanding surrender." In a word, the incident was an example of brigandage up to date. Faced with such a situation, Mr. Fearnley took the only sensible course, and agreed to the terms proposed, subject to the necessary limitation that he must submit the matter to the Sheffield Tramways Committee. With that the tramwaymen had to be content, and the meeting closed, the men whose duty it was to run the Sunday service of cars starting work nearly three hours after time. It is difficult to characterise in moderate terms the action of the Sheffield tramway employees. The very least that can be said is that they stripped themselves of the rights secured to them by the national agreement and stood forth as the protagonists of force instead of argument. Perhaps the whole action sprang merely from a thoughtless impulse to play a sharp trick upon their manager, and we hope that, at heart, the Sheffield tramwaymen are British citizens, not brigands.

THE BUDGET AND TRANSPORT.

Everyone interested in transport in all its branches has awaited with expectation, not unmixed with apprehension, the announcements of the Chancellor of the Exchequer in his budget proposals for the year. In "A Londoner's Diary," the *Evening Standard* sums up the situation effectively, and expresses the thought of 99 per cent. of those who have any right to opinion on the subject:—The most generally welcome feature of the Budget seems to be the removal of the petrol licence, the reduction of the tax, and the release of its formidable competitor benzol. It only remains to end the internment of the vehicles which are being needlessly held up in M.T. demobilisation centres for motor transport to enter into something like its own again, to the heartfelt relief of the general public, which is getting very tired of being hustled and buffeted or rejected altogether in the endeavour to catch buses, and of wasting still more precious time (in the effort to save it) by hunting for taxis. The opinion of the motor industry appears to be that it has little to complain of. Though there is small enthusiasm for benzol, the release of this spirit will have an immediate reaction on the price of petrol, which will mean more motoring for all, and a corresponding livening up of motor production. The removal of the petrol licence is thought in some quarters to be a sop extracted by the strong representations of the Automobile Association, and intended to placate the opposition of the motor industry to the Ways and Communications Bill. The preference afforded to Colonial-built cars is not regarded as likely to make any perceptible difference in the state of the home markets.

INCREASED FARES IN LONDON.

On Sunday, April 27, the higher scale of fares came into operation on all the London County Council Tramway routes south of the Thames. About forty different services are involved, radiating from the four principal termini—Victoria, Westminster, Blackfriars, and Southwark Bridge—to most of the outlying suburbs south of the city. At present, the general effect of the new charge has been to add a penny to each fare. All journeys beyond 1·5 miles which formerly cost a penny, now cost twopence, the twopenny ride is threepence, and the passenger accustomed to paying threepence now finds he must pay out fourpence. It can be easily understood that the alteration has not been accepted without serious and widespread complaint. The penny stages are not reduced by a half—in fact, the reduction amounts to less than a fourth; but the point at which each stage ends has been fixed with greater regard to distance than to popular topography. Nearly all the passengers, and even a few conductors, will take some time to find their bearings again. Meanwhile, the decline in the number of passengers is very marked. Probably this is partly the effect of resentment, and partly determination on the side of the public to demonstrate the futility of the higher-fares policy. After a week or two, numbers will, no doubt, resume travel by car, and the strangeness of the position will wear off. Judgment, therefore, on the L.C.C. policy must be suspended for a period.

Return Tickets on Sheffield. Tramways.—Sheffield Corporation Tramways and Motor Department on May 1 began the issue of return tramway tickets on week days at 2½d. on 1½d. fare sections. These tickets are issued on cars leaving any city or suburban terminus within the city limits up to 9 a.m., and the tickets are available for the return journey at any time on the same day.

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SHEFFIELD THREE-HOUR STRIKE.

During the week conflicting and almost unintelligible reports have appeared in the public press regarding the strike of Sheffield tramway employees which took place on Sunday, April 27. At a meeting of Sheffield Corporation Tramways Committee, held on Tuesday, April 29, the subject was discussed, and an official report was supplied to the press, of which the following is a summary: On Sunday, the 27th inst., in consequence of a dispute regarding the interpretation of the agreement dated March 20, which had been arrived at between the representatives of the Municipal Tramways and the National Transport Workers' Federation, the traffic employees held a meeting on the morning of that date and passed a resolution that until certain disputes with regard to the interpretation of the agreement had been settled in their favour, no man was to be allowed to leave the meeting room, and the cars were not to be taken out in accordance with the timetables for Sunday noon. The general manager reported that having addressed the meeting, ascertaining exactly what their objections were to the interpretation that was being placed upon the agreement, he had endeavoured so far as was reasonably possible to meet the wishes of the men in regard to the matter and fixed up, at any rate as a temporary measure, the working arrangements until such time as the new duty sheets could be brought into operation. The Committee, having heard the full report of the general manager in regard to the meeting and negotiations that had taken place, expressed their grave disapproval of the unwarrantable action of the employees in calling a strike without the slightest notice to the department. In consequence of the action of the tramwaymen, the Sunday tramway service, which starts at noon, was delayed for nearly three hours, to the serious inconvenience of the public.

EASTER HOLIDAY TRAFFIC.

LARGE INCREASES REPORTED EVERYWHERE.

The traffic receipts on Leeds Corporation Tramways for Easter were as follows: Good Friday, £2,190; Saturday, £3,631; Sunday, £2 114; Monday, £4,567. The total amounted to £12,502, showing an increase of £7,080 over the receipts in 1918. Monday's receipts constituted a record, though the number of passengers carried on the Whit Monday of 1917 was probably as great, for the penny fare gave a ride half as far again, and the receipts were £3,306.

For the four days ending Easter Monday, the receipts on Halifax Corporation tramways totalled £1,480 more than for the four corresponding days of Easter last year. Receipts on Monday amounted to £1,390, which constitutes a record for a single day, the next highest being Whit Monday, 1917, when the sum collected was £1,134.

"Too few cars" was the complaint at Bradford during the Easter holidays, the tramway receipts exceeding all previous records by over £3,000. The details for the four days are: Friday, £1,463; Saturday, £2 528; Sunday, £1,289; Monday, £3,056. The highest previous record of receipts on an Easter Monday was in 1916, when the total was £1,968.

The traffic on Glasgow Corporation tramways on the spring holiday was enormous, the receipts amounting to £5,890 for the day, representing an increase of £1,030 as compared with the spring holiday of last year.

Reporting on the Easter traffic, the tramway company of Bath gives the following figures: Easter, 1918, Friday, Saturday, Sunday, and Monday, 115,000 passengers; Easter, 1919, for the four day, 150,000 passengers.

At Birmingham, during the five days of the Easter holiday—Good Friday, Saturday, Sunday, Monday and Tuesday—over 3,000,000 passengers were carried on the tramcars, and 172,000 on the omnibuses. The returns were: Good Friday, trams, 450,000, omnibuses 26,000; Saturday, trams 700,000, omnibuses 32,000; Sunday, trams 400,000, omnibuses 17,000: Monday trams, 800,000; omnibuses, 57,000; Tuesday, trams 700,000, omnibuses 40,000. The routes chiefly patronised were Erdington and Ward End.

Easter Monday was a record day for Darlington tramways. The number of passengers carried was 31,317, and the receipts amounted to £157. The receipts from Thursday to Monday night showed an increase of £124 over the corresponding period of last year.

Taking the five days of the Easter holiday, from Thursday to Monday inclusive, Sunderland Corporation tramways receipts showed an increase of £980 over the corresponding period of last year. The total receipts amounted to over £25,000.

On Good Friday, Leicester Corporation tramways carried 163,663 passengers, or 43,476 more than on Good Friday, 1918. Saturday's total was 269,803, or 81,969 more than the corresponding holiday of last year.

Receipts on Aberdeen Corporation Tramways for the week ending Wednesday, April 23, showed an increase of £809 over the corresponding week of last year. The increase is largely due to the Easter traffic.

The report of Southend Corporation Tramways for the Easter week shows an immense increase in receipts over the corresponding period of last year. The receipts were £2,689 for last week, and for the corresponding week last year £677, showing an increase of £2,012. This astonishing result may, however, be partly explained by the air-raid scare to which Southend has naturally been subject all through the war.

MISCELLANEOUS NEWS AND NOTES.

Exit Women Conductors.—Exeter Corporation has decided to replace women tramway conductors by youths.

Cost of Current at Brighton.—It is proposed to increase the price of energy supplied by the Corporation to the tramways department from 1·75d. to 1·9d.

Industrial Reconstruction Council.—A conference on "Workmen as Directors," will be opened by Mr. G.H. Humphreys at the Institute of Journalists, Tudor Street, E.C., on Tuesday, May 6, at 6 p.m.

Fire at a London Tramway Depot.—An extensive building used as a store-house at the depot of the Metropolitan Electric Tramways at Finsbury Park was much damaged by fire on April 25.

Swansea Tramway Extension.—The Housing Committee of the Swansea Corporation urge that the Tramways Committee should exercise the powers possessed by the Corporation, and construct tramways to the site of the new housing scheme at Townhill.

Women Released at Portsmouth.—Women are to be replaced on the Portsmouth Corporation cars by returned soldiers. The women will be employed temporarily until the old employees are ready to take up their work after demobilisation.

Promotion of a Tramway Inspector.—After serving eighteen years with Sheffield Corporation tramways, advancing from conductor to inspector, Mr. E. Challoner has been appointed chief inspector of the Accrington Corporation tramways.

Costly Tramway Construction.—Preston Tramways Committee, in reply to a request for the extension of the tramways to provide employment, has replied that the cost of materials is at present prohibitive.

Walsall Tramways and Omnibus Extension.—Included in the bill which the Walsall Corporation is promoting in Parliament are provisions to enable the tramways department to link up the districts of Cannock-Litchfield and Suttonside by motor omnibuses.

State Enquiry into Omnibus Charges.—Replying to a question in the House of Commons, on Thursday, May 1, the Home Secretary said: "I have no power to fix or control omnibus fares in London, but as the matter is one of public importance I am making certain inquiries in the matter, and the London General Omnibus Company has agreed to put full information at my disposal."

Proposed Extensions at Southport.—An inquiry has been held by the Local Government Board into the application made by the Southport Corporation for powers to borrow £132,000. The money is to be used for extending the electricity undertaking, and it is proposed to scrap the main portion of the engines at present in use, and to instal turbine sets.

Leicester to Spend £18,000.—The Tramways and Electricity Committee of Leicester Borough Council have purchased, at a cost of £6 10s. per square yard, 256 square yards of land for a site on which to erect an electrical sub-station. Two rotary converters, of 1,000 k.w. each, with transformers and switchgear, will be installed. The aggregate cost is estimated at £18,000.

Legislators Visit Slough Depot.—The Committee of Lords and Commons appointed to enquire into what is known as the "Slough scandal," paid a visit to the works at Cippenham, on Thursday, May 1. It is reported that the Committee members were deeply impressed with the great extent of the works and the size of the buildings. "The buildings were gorgeous," one M.P. is reported to have said to a correspondent of the *Daily Mail*. "One we saw is I should think, the largest hall in the British Empire.'

Edinburgh Tramway Fares.—The Edinburgh Trades Council has sent a letter to the Tramways Committee protesting against the recent increase in fares in Edinburgh, and expressing the hope that the Corporation will restore the penny fares when they take over the tramways on July 1. The Town Council, however, some time ago decided to maintain the fares as they then existed, and they will accordingly revert to the penny stages when they take over the working of the tramways, unless they have urgent cause to decide otherwise before that time.

Fares Increased at Liverpool.—The Tramways Committee have decided to increase the fares on the basis of 1d. for 1·5 miles, with a proportionate increase for longer stages. One member of the Committee proposed an amendment that no increase should be made until 50 per cent. of the reserve, now amounting to £406,280, was exhausted, but the amendment was defeated. It is stated that the proposed increase in fares will mean an additional revenue of about £140,000.

Report on Edinburgh Track.—Preliminary to taking over the tramways from the Cable Company, Edinburgh Town Council demanded that the track, which has fallen into disrepair, should be put into working condition. The Cable Company took the view that the Council's demands were excessive, and the matter was referred to arbitration. Sir A. B. W. Kennedy, the appointed arbitrator, has now issued his award. He finds that certain portions of the track must be relaid with new rails, and certain other parts with rails partly used.

Institution Meeting.—A joint meeting of the Institution of Electrical Engineers and the Iron and Steel Institute will be held at the Institution of Civil Engineers, Great George Street, Westminster, S.W., on Thursday, May 8, at 2.30 p.m., when the following papers will be discussed:—J. Bibby, "Developments in Iron and Steel Electric Furnaces"; W. H. Booth, "The Booth Hall Electric Furnace"; H. A. Greaves, "Application of Electrical Energy to the Melting of Metals"; R. G. Mercer, "Electric Furnaces in the United Kingdom, 1918"; Axel Sahlin, "A New Type of Electric Furnace"; Victor Stobie, "Large Electric Steel Melting Furnaces."

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April Storm Interrupts Tramway Services. The great storm which raged over the country on Sunday, April 27th, was felt with special severity on the coast of the Firth of Forth. At Musselburgh, all the tramcars were withdrawn from the streets, because the trolley wires had been wrecked near the terminus at Joppa. The tramway service in High Granton Road, Leith, was stopped for a time, owing to blown-down telephone wires falling across the overhead electric tramway wires. For a considerable time the traffic on that part of the route had to be diverted to Lower Granton Road.

Relaying Tramway Rails in Aberdeen.—Dean of Guild Meff, convener of the Tramways Committee of Aberdeen Town Council, brought before a recent meeting of the Committee the urgent necessity for re-laying the tramway track between Union Bridge and Castle Street. This work, the Convener explained, would give employment to a considerable number of men, as it would have to be expeditiously carried out. The matter was remitted to the burgh surveyor and the tramway manager, to bring up a report at the earliest possible date, with an estimate of the cost of carrying out the work.

A Large Reconstruction Programme for Liverpool.—A procession of disabled and demobilised soldiers and sailors, numbering 5,000, marched to Liverpool Town Hall, where their spokesmen laid before the Acting Lord Mayor a strong protest against unemployment, and offered a programme of work as follows: Repairing the city tramway track; repairing two hundred tramway cars; building new cars and motor-omnibuses; repairing cobbled streets with paving; constructing open-air gymnasiums and cycle and running tracks in parks; pushing on with housing schemes. The deputation asked that a meeting be convened of employers, of trade union officials, and representatives of discharged men.

London Traffic Overcrowding Scandal.—London M.P.'s have decided to hold a meeting on Monday, May 5, to discuss the traffic situation in the metropolis, and to frame resolutions urging the Government to take action. In an interview, Sir William Bull, who is taking a prominent part in the movement, said that the position to-day is intolerable. "Six or eight new tube railways are wanted—express tubes running out to new suburbs without a number of intermediate stops. . . Thousands more omnibuses are wanted, and must be put on the streets, if necessary by Government action and help. Personally, I think that the days of electric tramways are numbered."

Edinburgh Tramways Traffic Superintendent.—A Sub-Committee of Edinburgh Town Council Tramways Committee have selected a short list of five from the applicants for the post of traffic superintendent. The names of those selected are: L. C. F. Bellamy, M.C., A.M.I.E.E., at present in the Royal Engineers, formerly electrical engineer and tramway manager of Ilkeston; W. T. Britton, chief traffic assistant of the Corporation Tramway Department of Wallasey; F. Lafferty, 32, Thirlestane Road, traffic superintendent of Edinburgh and District Tramway Company; Samuel Morrison, chief time-table clerk of Glasgow Corporation Tramways; Walter T. Young, principal assistant to the chief manager of the Belfast City Tramways. These candidates will be interviewed at the next meeting of the Tramway Committee, when the recommendation to the Council will be made. The salary to be paid is £450

Lanarkshire Tramway Strike.—The strikers on Lanarkshire tramways are still receiving strike pay, and so far no prospect of a settlement of the dispute is in sight. During last week about twenty cars were running between Uddingston, Burnbank, Hamilton Motherwell, Wishaw, and Mossend, and near the end of the week Larkhall had been added to the circuit. Last Saturday, the meeting of delegates of the Lanarkshire Miners' Union, held at Hamilton, passed a resolution of sympathy with the strikers, and urged the miners to avoid using the tramways during the course of the dispute. The Miners' Union further agreed to approach the Board of Trade for the purpose of urging the Department to make arrangements for transferring the undertaking to the local authorities of the district. From the traffic returns it appears that the receipts on the Lanarkshire tramways for Easter week amounted to £112, as compared with £3,510 for the same week of last year. In spite of that large decrease, the tramways have made a total increase on the year up to date of £2,050.

CONTRACTS AND ORDERS.

Frederick Smith & Co., Ltd., are to supply trolley wire to Glasgow Tramways Committee.

The J. G. Brill Company have received an order from Glasgow Tramways Committee for truck frames.

Edison Accumulators, Ltd.—The tender of this company for a 3½-ton electrically-driven vehicle has been recommended for acceptance by a committee of the Luton Council.

Glasgow Tramways Committee have accepted the following among other tenders: axles, Glasgow Railway Engineering Co., Ltd.; galvanised steel wire, Whitecross Co., Ltd., Sir J. Stewart and Co., Ltd.; commutators, P. R. Jackson and Co.; drop forgings for jacks, A. Harper, Sons and Bean, Ltd.

PERSONAL.

Major Herbert Bell, electrical engineer of Hull, having returned to his duties after four years' service in the Army, is to visit the United States in order to investigate and report on electrical developments.

FINANCIAL.

Melbourne Tramways and Omnibus Co. A dividend of 1s. per share is announced

Plymouth Corporation Tramways.—The annual financial statement shows that the total income amounted to £121,047, of which £33,024 was gross profit. After payment of capital charges, etc., the net surplus is £10,679. Of this amount £6,000 is to be appropriated for working capital, and the balance of £4,679 carried to the reserve fund.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended April 30, amounted to £72,154, an increase of £14,979, as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1st (the commencement of the financial year) to April 30th (four weeks and two days) the total receipts were £325,389, an increase of £86,857 on the corresponding period of 1918.

Edinburgh Tramway Estimates.—Edinburgh Tramways Committee have approved the estimates submitted by the general manager (Mr. R. S. Pilcher) for the period from June 30 this year, when the Corporation takes over the working of the tramways, to May 15, next year. The total expenditure is estimated at £329,225 and the total revenue at £401,855, leaving a balance of £72,630, which will be required for interest and sinking fund contributions.

Portsmouth Corporation Tramways.—The tramway accounts show an income of £121,047, and a gross profit of £33,024. There is a net profit on the undertaking, after payment of all charges, of £10,679. The Tramways Committee have retained £6,000 as a working balance, and have allocated £4,679 to the reserve fund. The number of passengers carried was 28,438,343, against 26,187,549. These figures do not include 43,600 wounded soldiers carried free.

South Shields Borough Tramways.—The report for the year 1918, presented by Mr. J. C. Whiteley, manager of South Shields County Borough Tramways, shows a total revenue of £51,726, an increase of £7,288 over 1917. Working expenditure is £38,726, an increase of £3,040, but the total includes £5,344 reserved for repairs to permanent way, overhead equipment and rolling stock. After paying interest on capital, etc., £5,864, and contribution to tinking fund, and various repayments, amounting in all to £4,198, shere remains a balance of £4,350, which is to be given in aid of rates.

Tynemouth and Distritc Electric Traction Company.—The report for the year ended December 31st last shows that the total revenue for the year amounted to £25,552, an increase of £4,263 over 1917. The expenditure, including a provision of £2,067 for renewals, was £17,985, an increase of £6,512 as compared with the previous year. The surplus on the year's working is £7,566, making with £612 brought forward from the previous year a total of £8,177. The amount is to be appropriated as follows: To reserve, £1,000; to 5 per cent. dividend on the preference shares, £1,525; to 8 per cent. dividend on the ordinary shares, £3,712; to next account, £1,940.

W. T. Henley's Telegraph Works Co.—The report of last year shows a gross profit of £203,410. After deducting debenture interest and other items, and the amount written off for depreciation and repairs, and adding the amount brought forward (£112,041), there is a total balance of £260,095. Allowing for income tax, reserve account, dividend on preference shares, and interim dividend on ordinary shares, there is an available balance of £179,509. A final dividend of 2s. 6d. per share on the ordinary shares, less income tax, making 3s. for the year, has been declared, and £7,500 is carried to the staff pension fund, leaving £122,009 to be carried forward. At the meeting on Thursday, Mr. George Sutton (chairman) said that the accounts dealt with trading during a year of war. After November 11th, they closed as rapidly as possible the work which they were doing for the war, but they have been hampered in the execution of peace orders by the difficulties in procuring raw material, and by insufficiency of labour. While they were proposing a 15 per cent. dividend, it was less than 4½ per cent. on the actual capital employed in the business. He had sometimes thought that they might be withholding too great a proportion of the profits earned, but the security of capital had been their first object.

Results of Increased Fares at Bradford.—An interim report on the result of last year's operations on Bradford Corporation Tramways, just issued, goes some length towards justifying the contention that raised fares will have the effect of improving the financial outlook of tramway undertakings. For the 364 days covered by the report, there were 7,709,703 fewer passengers than in 360 days of the previous year, and yet there was a net increase in receipts of £92,075. This increase is wholly due to the higher fares, as may be seen from the following table:

		Increase.
Traffic Receipts	£451,877	£89,964
Rail less vehicle receipts	15,122	2,873
Miscellaneous	5 491	394
Parcels	11 974	
Total*	£484 464	£93,281
Decrease in Parcels		£1 156
Net increase		£92 075

The actual number of passengers carried was 76,419,459, as against 84,129,252. The car miles run were 5,269,834, and the receipts per car mile were 22.06d., an increase of 6.12d. The total number of units consumed for traction purposes was 11,027,312, a decrease of 1,372,202.

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Newcastle Tramways.—The annual report of Mr. Ernest Hatton, engineer and general manager, shows that both the income and expenditure of the Newcastle Corporation tramways have again considerably increased. Alluding to the continued tendency for increases in expenditure, Mr. Hatton says that the undertaking is about to pass through the most difficult period of its existence, inasmuch as the income cannot go on increasing at the rate it has done during the last few years, and there is little prospect of the expenses decreasing, except under certain headings. Consequently, with the alterations which are taking place daily, some revision of fares must be considered. The comparative figures show the traffic revenue in 1917-18 to have been £409,114 5s. 1d., as against £346,334 4s. 3d. in 1916-17. Other revenue was £8,914 6s. 7d. against £10,200 12s. 4d., making a total of £418,028 11s. 8d., as compared with £356,534 16s. 7d. The working expenses increased from £203,399 0s. 11d. to £248,394 2s. 3d., the balance (gross profit) on the year being £169,634 0s. 5d., as compared with £148,235 15s. 8d. Adding to this the interest on investment, there was a sum available of £176,512 11s 5d., against £154,619 0s. 11d. in 1916-17. Among the charges met out of this was a sum of £16,830 15s. 10d. for dependents of men on service, and there was a final balance of £90,785 17s. 3d., as against £62,902 17s. 5d. This was appropriated by income tax, contribution to rates (£14,000 against £7,000), insurance reserve and renewals fund, in which there was a balance of £155,251 1s. 2d. The following items in the statistical information are of interest:—

	1917.	1918.
Car miles run	5,833,800	5,971,329
Passengers carried	78,180,246	91,648,545
Passengers carried per car mile ..	13.41	15.35
Traffic revenue per car mile	14.53d.	16.82d.
Average fare per passenger	1.084d.	1.095d.
Cost per passenger	0.630d.	0.650d.

POSITIONS VACANT.

COUNTY BOROUGH OF WIGAN.

The Wigan Corporation invite applications for the position of Chief Clerk in the Tramways Department.

Candidates must have had previous clerical and administrative experience in Tramway work. Commencing salary £200 a year.

A list of duties and conditions of the appointment may be obtained on application to the Tramways General Manager, Market Place, Wigan.

Applications, endorsed "Tramways Chief Clerk," to be delivered to me not later than Saturday, May 10th, 1919.

WILLIAM HENRY TYRER,
Town Clerk.

Town Clerk's Office, Wigan.
April 23rd, 1919.

FOREMEN FOR RUNNING SHED.

Foremen required for Tramway Car Running Sheds. Applicants should have sound technical and practical knowledge of tramway work and management of men.—Apply by letter to the GENERAL MANAGER, London County Council Tramways, 23, Belvedere Road, S.E.1.

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TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C. ..	Apr. 22	460	769	+ 309	3	1,880	—
Aberdeen Corporation ..	„ 23	2,992	3,091	+ 899	47	122,721	+ 20,498
Ayr Corporation ..	„ 26	416	754	+ 338	48	26,195	+ 5,940
Birkenhead Corporation	„ 20	2,073	2,530	+ 457	3½	9,260	+ 1,413
Blackburn „ ..	„ 9	1,441	2,086	+ 645	2½	4,355	+ 361
Bradford Corporation ..	„ 26	7,527	13,612	+ 6,085	4	42,951	+ 12,896
Burnley Corporation .	„ 26	2,115	3,529	+ 1,414	..	..	..
Burton-on-Trent Cor. .	„ 27	377	502	+ 125	4	1,748	+ 282
Bury Corporation ..	„ 27	1,879	2,749	+ 870	3½	9,523	+ 2,981
Chatham & District ..	„ 24	1,170	1,794	+ 624	16	20,735	+ 1,637
Cork Electric	„ 24	495	710	+ 215	16	8,996	— 614
Derby Corporation ..	„ 26	1,440	1,798	+ 358	4	6,318	+ 857
Dundee City	„ 23	1,538	2,380	+ 842	49	97,124	+ 20,075
East Ham Corporation ..	„ 26	1,288	2,020	+ 732	3½	7,064	+ 2,261
Glasgow Corporation ..	„ 26	28,659	33,353	+ 4,694	47½	1,360,179	+ 103,368
Glossop (U.E. Sup. Co.) ..	„ 26	175	259	+ 84	17	3,726	+ 693
Halifax Corporation ..	„ 22	2,227	5,268	+ 3,041	3½	11,760	+ 3,601
do. Motor Buses ..	„ 22	52	109	+ 57	3½	264	+ 80
Huddersfield Corporation	„ 26	3,441	6,392	+ 2,951	4	19,283	+ 5,205
Ilford U.D. Council ..	„ 26	871	1,254	+ 383	4	4,418	+ 1,087
Ipswich Corporation ..	„ 26	662	896	+ 234	4	3,081	+ 654
Isle of Thanet ..	„ 26	220	1,079	+ 859	29½	11,193	+ 5,758
Kilmarnock Corporation	„ 26	239	320	+ 81	49½	13,302	+ 2,855
Lanarkshire	„ 24	3,575	861	— 2,714	16	53,006	— 665
Leeds City	„ 26	11,411	20,226	+ 8,815	4	63,111	+ 22,230
Leicester Corporation ..	„ 26	4,235	6,365	+ 2,130	..	..	..
Leyton U.D. Council ..	„ 24	1,766	3,723	+ 1,957	4	12,041	+ 4,502
Liverpool Corporation ..	„ 26	17,415	24,173	+ 6,758	16½	342,692	+ 65,082
Llandudno & Colwyn Bay	„ 18	315	467	+ 152	20	6,220	+ 912
London County Council ..	„ 30	57,175	72,154	+ 14,979	4½	325,389	+ 86,857
Maidstone Corporation ..	„ 24	237	405	+ 168	3½	1,441	+ 332
Manchester Corporation	„ 19	22,850	31,138	+ 8,288	3	88,623	+ 21,999
Newcastle-on-Tyne Cor.	„ 19	8,460	9,289	+ 829	3	26,856	+ 3,546
Northampton Cor. ..	„ 25	873	1,522	+ 649	4	4,558	+ 1,157
Nottingham Corporation	„ 24	5,811	7,483	+ 2,672	4	24,747	+ 6,006
Oldham Corporation ..	Mar. 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation ..	Apr. 24	1,176	1,633	+ 457	3½	5,295	+ 1,272
Rhondda Tramways ..	Mar. 20	1,633	2,150	+ 517	11	23,210	+ 5,603
Rotherham Corporation	Apr. 30	2,094	2,362	+ 268	4½	10,015	+ 1,156
Sheffield Corporation ..	„ 27	13,637	18,231	+ 4,594	4½	80,163	+ 18,281
Southampton Cor. ..	„ 23	2,344	3,181	+ 837	3½	9,052	+ 813
Southend-on-Sea Cor. ..	„ 23	677	2,689	+ 2,012	4	5,835	+ 2,306
South Shields Cor. ..	„ 12	1,031	1,342	+ 311	3	2,276	+ 386
Sunderland Corporation..	„ 27	2,069	3,080	+ 1,011	4	11,283	+ 3,015
Swindon Corporation	Mar. 26	301	264	— 37	51½	15,687	+ 1,467
Torquay Tramways .	Apr. 17	708	907	+ 199	15	11,523	+ 751
Tyneside Trys. & Trmrds.	„ 9	909	984	+ 75	15	11,943	— 498
Wallasey Corporation ..	„ 26	1,615	2,958	+ 1,343	3½	9,308	+ 3,026
Walsall Corporation ..	„ 26	1,114	1,800	+ 686	5	5,519	+ 949
Walthamstow U.D. Coun.	„ 20	1,220	2,025	+ 805	4	7,081	+ 2,516
Warrington Corporation	Feb. 20	725	851	+ 126	51	39,949	+ 8,793
West Ham Corporation	Apr. 24	3,781	6,271	+ 2,490	3½	18,802	+ 4,923
Wigan Corporation .	Jan. 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	Apr. 22	£59,417	£55,406	16	£918,584	+ £38,631
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Mar.	3,803	3,051	48	42,131	+ 1,444
Brazilian Traction (Mrs.)	Feb.	7,315,000	7,972,000	8	16,494,000	+ 1,342,000
Brisbane	Feb.	32,009	34,380	8	72,955	+ 6,446
British Columbia .. $	Feb.	501,150	645,415	34	4,740,999	+ 756,620
Buenos Aires Lacroze ..	Mar.	42,647	47,370	39	390,579	+ 44,158
Burmah Tram. & Light Rs.	Mar. 31	27,906	38,440	34	289,170	+ 77,029
Calcutta .. .. Rs.	Apr 26	71,869	80,494	16½	1,410,741	+ 201,016
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Mar.	5,316	2,400	13	8,406	— 4,952
Cordoba	Jan.	12,844	13,942	44	145,654	+ 10,915
East India	Mar.	1,729	2,016	34	15,628	+ 5,132
Hong Kong.. .. $	Mar. 15	12,349	13,100	11	158,224	+ 4,479
Kalgoorlie	Dec.	3,044	2,848	52	33,686	+ 1,078
La Plata	Mar.	5,348	6,592	13	18,019	+ 1,971
Lima	Feb.	41,921	46,082	8	91,444	+ 5,962
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Feb. 28	33,558	35,254	6	166,609	+ 17,415
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	+ 53,959
Manila .. .. $	Jan.	167,000	231,585	4	231,585	+ 64,585
Montevideo	Mar.	36,659	41,070	21	190,891	+ 18,558
Para	Mar.	24,848	26,022	17	97,585	+ 3,164
Pernambuco	Apr. 27	4,387	5,385	16½	89,863	+ 11,478
Peruvian .. .. $	Feb.	925,410	948,470	34	7,973,835	— 229,195
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Mar.	5,955	7,533	13	19,600	+ 2,622
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore .. .. $	Mar. 15	14,161	16,307	11	178,525	+ 31,018
Toronto .. .. $	Feb.	981,933	1,015,797	8	2,122,637	+ 72,385
Winnipeg .. .. $	Feb.	298,899	371,162	8	761,701	+ 128,160

WANTED.

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SATURDAY, MAY 10, 1919.

STATESMANSHIP AND FARES.

LONDON passenger traffic facilities have suddenly assumed the importance in the political mind which has long been recognised by the ordinary citizen. For years past the traffic has been accumulating in masses. New suburbs have been built and extended, population has increased in numbers and mobility, business activity has quickened, and each factor has added to the demand for passenger traffic facilities. While all that growth was going on, London was still a congeries of small local authorities, and when the London County Council came into being the traffic problem had already assumed formidable dimensions. Government took no heed, and municipal statesmanship was either hampered by petty interests or restricted in vision. In the absence of statesmanship, private financial enterprise held the field. Circular railways were constructed, tubes were pierced through the underground of the city, and omnibus services were extended. Immense sums of money were sunk in those enterprises, and the labour and ability expended can hardly be estimated in mere figures. The only revenue of those enterprises is derived from the fares of passengers, and that the charges have been equitable and proportioned to the services rendered has been proved by the continual growth of the traffic. Economic forces work in small detail. Though the aggregate figures of such a company as the Underground are immense, they are made up of the small contributions of individuals, each one of whom determines the expenditure for himself or herself. Every passenger has to resolve the question whether or not expenditure of a penny in tube or omnibus fare is advisable and economical. The affirmation of millions is the same as the assent of one individual; that is to say, each ticket or journey viséd by the ticket is sold as value for value. But there is the other side of the question, and it has come into prominence now. Passenger services vital to the life of the metropolis of the State are of consequence to the nation, and must be maintained efficiently. War and post-war conditions have adversely affected all the passenger services of London. First, commandeering of omnibuses and enlisting of tramway and omnibus employees, and later scarcity of materials, high costs of operation, combined with increased need for facilities of travel, have produced a situation of great complexity and danger. It is impossible to trace at short length the various ramifications of the problem, but the principal factors are obvious. On the one hand, private and municipal capital, which has provided the tube, tramway and omnibus services, is entitled to a fair return, and must be allowed to charge fares which will meet expenditure. On the other hand, the interests of the community require that the cost of travel shall not be made an oppressive burden on industry and commerce. Adjustment of those equally just and almost equally important claims is imperatively demanded. Solution of the problem ought not to be beyond the compass of British statesmanship. We use the word statesmanship advisedly, for that is the quality of mind required. Petty pandering to the desires of the passenger multitude, whether by local authorities or Parliament, without sound economic prevision, or, on the other hand, sanction of charges oppressive to the community which might be saved by increased efficiency in operation, will not serve. The solution must relate to the future as well as to the present, if the problem is not to return in more formidable shape.

NORTHAMPTON TRAMWAY POWER SCHEME.

An interesting report by Northampton Tramway Committee has been presented to the Town Council, the effect of which is that the Corporation should cease operating their own tramway power station and should purchase electricity for the tramways from the local electric light and power company, and so save about .6 of a penny per unit. The Committee, in their report point out that it became necessary recently to take the company's supply to enable the cars to continue running. The breakdown was due to the defective state of the boilers, and the only remedy is the installation of another type of boiler. The electric light company offered to supply all the current required for the tramways, including the lighting of the cars, depot, and repair shops, with a minimum of 1,000,000 units per annum. If 1,250,000 units were consumed the price would be 1.4d. per unit, and for 1,500,000 units and upwards 1.33d. per unit. On the basis of 1.4d. per unit, the company's offer, on the requirements of the tramways during the year ended March 31st, 1918, would have cost £7,080. The tramways department's own power charges for that year were £8,690, an excess of £1,610. If the sale of the power station site, buildings, and machinery produced enough to liquidate the existing debt of £11,548 on the installation, the annual saving would be £3,642.

The alternative to the proposal is to reconstruct the power station. New boilers and the extension of the station are estimated to cost £5,000, to be paid out of reserve fund, and involving an annual repayment to that fund of £415. Allowing for a saving of £650 on repairs by installing Lancashire boilers, the cost of generation of power, based on the 1918-19 figures, would be £8,040, making a total with the repayments of £8,455. The cost of the current, if purchased from the company, would be £7,080, the estimated difference therefore being £1,375. The annual repayments on the present debt, £2,034, would have to be continued, and the excess of the tramways department costs would be £3,409 per annum.

The committee further state that the figures show that if the department continues to generate its own power it will only do so at an estimated cost of approximately .6d. per unit greater than the offer made by the company.

The committee recommended the acceptance of the offer for five years.

The Council on Monday adopted the report.

STANDARD ELECTRICITY MEASUREMENT.

The Board of Trade announce that the coils and instruments referred to in the Schedule to the Order in Council of January 10th, 1910, which approved the several denominations of standards set out in that schedule as denominations of standards for the measurement of electricity, will on and after May 8th, 1919, be deposited at the National Physical Laboratory, Teddington, Middlesex, instead of at the Board of Trade Standardising Laboratory, 8, Richmond Terrace, Whitehall, London.

All communications respecting electrical standards and instruments for test should on and after the 8th day of May, 1919, be sent to the Director of the National Physical Laboratory, Teddington, Middlesex.

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LABOUR SATISFIED AT SHEFFIELD.

Two separate causes threatened last week to disturb the peace of Sheffield Corporation Tramways Department in a very serious degree, but it seems that both troubles have been got over. First, there was the difference between the Corporation Tramways Committee in regard to interpretation of certain clauses of the national agreement, which resulted in the notorious "hold-up" of Sunday, April 27, and subsequent difficulties. With regard to this matter, Sir W. Clegg, chairman of the Tramways Committee, and Mr. A. R. Fearnley, general manager, met a deputation from the Amalgamated Association of Tramway and Vehicle Workers, and discussed the whole situation with them. No official report of the conference has yet been issued, but a press correspondent obtained the assurance from the deputation that a settlement had been effected which they can with confidence recommend to the acceptance of the men's unions. The second difficulty arose over the dismissal of a conductor, upon the complaint of a member of the public, without formal investigation into the charge. The conductor has been unconditionally reinstated, and resumed duty on Saturday, May 3. The Sheffield Corporation Tramways committee have agreed to the principle that no employee shall be punished without the fullest investigation.

*** With reference to the above subject, the Secretary of the Sheffield Branch of the Amalgamated Association of Tramway and Vehicle Workers sends a letter controverting the article in our issue of last week, in which he says: "The men did not 'pass a resolution that they would refuse to begin to work until the manager had satisfied their demands.' The resolution was 'that no one leave the meeting until the business is finished.'" The Secretary professes to quote verbatim, but the article reads: "The tramway men passed a resolution which practically implied that all present would refuse to begin work until the manager had satisfied their demands." We are still of opinion that the resolution, as stated by the secretary, admits of no other interpretation than the implication assumed.

Again, the tramway men's Secretary says: "He was not told 'that the tramway men totally dissented from his interpretation, and that not a man would start until he agreed to their terms.' The terms were discussed by both sides, certain assurances were given, not 'at the point of the pistol,' but because they were reasonable and fair." Here, again, is misquotation, but the version may be allowed to pass. The real point is that the manager, preliminary to the discussion, was informed of the resolution which had been passed. It is quite possible to argue that the men merely wished to let the manager understand how deeply interested they were in the business on hand, but Mr. Fearnley took it as something more, and others are fully justified in accepting his judgment. Moreover, the men's Secretary says that "assurances were given," and it is therefore only reasonable to suppose that these assurances were "asked," and that the asking was part of the business of the meeting which was to absorb the energies of the tramway men.

Once more, the Sheffield tramway men's Secretary says: "It is not true to say the cars were nearly three hours late. Quite a number of employees were at work ten minutes after the meeting closed, although some of them would not get a meal until after five or six p.m., and had left home at nine a.m." Pathetic, perhaps, but the hardship pictured is nothing to what the fathers of the trade union movement bore without a murmur for the sake of "the cause." Let that pass, however, and note the calculated indefiniteness of the Secretary's statement. Not all, but "quite a number," and not the length of time after the hour of service, but "ten minutes after the meeting closed." That might have been ten o'clock at night, so far as the Secretary's argument and the men's resolution imply. Everyone hopes that the "good relations between men and management which . . . . are desirable" will be fostered and maintained, but controversial methods of the character employed by the Sheffield tramway men tend to damp the ardour of the most optimistic.

SANDBERG'S "IN-SITU" TREATMENT OF RAILS.

In our issue of April 11th, 1918, a description was given of Messrs. Sandberg's patent process for hardening existing tramway rails in position without disturbing the rails or pavement. At that date, with the exception of experiments on a small scale at Leeds, the only contract secured was on the Croydon Corporation tramways. At the present time Messrs. Scholey and Company, Ltd., 56, Victoria Street, Westminster, the licensees and contractors for the patent, inform us that they have contracts with the following tramways: Birmingham, Liverpool, Croydon, Manchester, Glasgow, Bournemouth, and the Metropolitan (London). Repeat orders have been obtained from the Corporations of Manchester, Birmingham, and Croydon, and negotiations are being completed with a number of other undertakings.

The results so far obtained are described as most encouraging, and as providing definite proof that the treatment is successful in retarding, if not actually preventing, the development of corrugation. The process has been introduced at a most opportune time, and apart from the increased resistance to wear, the mitigation of the corrugation trouble, and the prevention of battering at joints, are considerations which, we venture to think, amply justify the cost of the treatment.

Hastings and Overhead Wires.—The Town Council have appointed a committee to consider the question of adopting the overhead wire system for the tramways on the Front.

GLASGOW FARE SCHEME.

Reporting on the question of fares, Mr. James Dalrymple, general manager of the Glasgow Corporation tramways, said that it was now absolutely necessary to increase the revenue in order to meet the increase in wages and the higher cost of materials. It was impossible to carry any more passengers owing to the lack of cars. What was wanted was an increased revenue from the present service. With an average revenue per passenger of .78d. it was impossible to make ends meet. It was hoped that the Corporation would insist upon a reasonable return on the £4,000,000 invested in the undertaking. Mr. Dalrymple estimated that the revenue of the financial year which ends on the 31st of this month will be £1,521,215, and the expenses £1,474,800, a surplus of £46,415. The amount set aside for depreciation, £124,000, was the same as for the present year, a sum which was now quite inadequate. The wages bill for the year 1913-14 was £441,048; for the current year it was estimated at £830,000, and for the following year £950,000. The revenue for the next year he estimated at £1,571,000, and expenditure at £1,736,560, including £245,000 for depreciation and renewals, showing a deficit of £165,560. Mr. Dalrymple suggested five schemes by which an increase in fares could be effected: (1) by reverting to the scale of fares in force prior to 1901; (2) by charging a halfpenny per stage; (3) a halfpenny added to each of the present fares; (4) the abolition of the halfpenny fare and to give three stages for a penny; (5) a scheme to accept only a special token with a face value of ½d. for the present halfpenny distance, such tokens to be purchased in quantities at the face value, and no cash to be accepted for any fare less than a penny. The Town Council will consider the scheme next week.

THE "STEVENS" PETROL-ELECTRIC VEHICLE.

A demonstration of the capabilities of the Stevens three-ton War Office subsidy petrol-electric vehicle in supplying current for electric welding was given before a company of press representatives on Wednesday last at Messrs. Denni Brothers Works, Guildford. The welding equipment used was that supplied by the Quasi-Arc Welding Company, of Laurence Pountney Hill, Cannon Street, E.C., and the demonstration included a wide variety of welding operations, all of which were executed in a most satisfactory manner and with remarkable rapidity. These included the building up of a solid feather on a piece of heavy shafting, the building up of a worn key-way on a heavy mild steel casting, and a number of other operations which clearly indicated the great value of a mobile plant which made such repairs possible to machinery and structures in position. A special feature of the demonstration was the fact that when working at 105 volts, two separate and distinct welding equipments could be operated at the same time from the same generator; and, further, that by means of an appliance recently developed by the Quasi-Arc Company, it has been found possible to work efficiently at 60 volts, which means that three separate welding plants can be run simultaneously.

After the welding demonstration was completed, the company were given an opportunity of testing the running capabilities of the Stevens machine in the hilly district which surrounds Guildford, and although the trip was made in an ordinary standard War Department lorry, the universal opinion was most favourable as to the smoothness of the running and the excellence of the control under all conditions of speed and gradient.

WHITLEY COUNCIL FOR THE ELECTRICAL INDUSTRY.

The first meeting of the Joint Industrial Council for the electricity supply industry was held at Montague House, London, on May 1st. Mr. G. J. Wardle, M.P., Parliamentary Secretary to the Ministry of Labour, said it was the fourth council established for industries or services in which local government authorities are concerned, the councils for the waterworks undertakings industry, local authorities' non-trading services, and the gas industry having held their first meetings. The councils for the electricity supply, gas and waterworks undertakings industries include both municipal and company-owned undertakings. Alderman W. Walker, of the Incorporated Municipal Electrical Association, was elected chairman, and Mr. A. de Turckheim, secretary of the Incorporated Association of Electric Power Companies, was appointed secretary *pro tem.*, for the employers' side of the council The trade union side of the Council will nominate the vice-chairman and will appoint their secretary at an early date. All communications should be forwarded for the present to Mr. A. de Turckheim, Sanctuary House, 33, Tothill Street, Westminster, S.W.1.

Motor Spirit Licences.—The Board of Trade announces that on and after May 17, 1919, motor spirit may be purchased without the production of a motor spirit licence. Any holder of a full-duty or half-duty motor spirit licence who has not been supplied with the total amount of motor spirit authorised to be supplied by his licence may apply to the Petrol Control Department for an appropriate repayment of duty, and such application must be accompanied by the licence in respect of which repayment is claimed. Repayment will not be made in respect of loose vouchers. Applications for repayment should be made as soon as possible after May 16, 1919, and addressed to the Petrol Control Department, 19, Berkeley Street, London, W.1.

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EFFECTS OF CONCESSIONS TO EMPLOYEES.

The chairman of Ashton Corporation Tramways Committee, Mr. R. S. Oldham, drew the attention of the Town Council to the effects of the new conditions upon the finance of the undertaking. Up till the new agreement came into operation, the working week was 57 hours, and now it is brought down to 48 hours. In pre-war times the annual wages bill was £5,800, and now it was £13,500. If these extra charges continued, there would have to be an increase in the fares.

Chester Corporation Tramways manager has reported to the City Council that the cost of the increases in wages and reduction of hours entailed by the National agreement would be about £1,250 per annum. The Council adopted the recommendation of the Tramways Committee that all penny fares should be increased to three-halfpence, except in the case of school children during certain hours, the latter to be considered again by the Committee.

NEW AND PROSPECTIVE WORK.

Hornsey Town Council propose to purchase six electric motor vehicles for the collection of house refuse. The cost will be approximately £11,500.

The cost of constructing new track in Manchester Road, which the Bradford Tramways Committee are to carry out, is estimated at about £52,503.

MISCELLANEOUS NEWS AND NOTES.

Free Rides Withdrawn.—The privilege that sailors and soldiers have enjoyed of riding free on the Leeds tramway cars is to be withdrawn except as regards men in hospital uniform.

Birmingham Buying Electrics.—The Birmingham Corporation have purchased three electric vehicles for the collection of house refuse at a cost of £1,304 each, and intend yearly to displace horses by the purchase of further vehicles.

Applications for Omnibus Powers.—Among the local authorities applying for powers in the present session for the running of motor omnibuses are the London County Council, Middlesborough, Stockton-on-Tees, Stretford, and Tynemouth.

Tramway Extensions and Omnibuses for Coventry.—The Corporation propose to apply for Parliamentary powers to extend the tramways and to run motor omnibuses on routes within a radius of ten miles of the city.

Home Pride.—Wallasey Town Council has decided not to send a deputation to America. In the course of a discussion one of the members expressed the opinion that they had men at home quite as capable of dealing with their tramways as anyone in America. He did not propose to bow to America or to any other country.

Traffic Congestion at Glasgow.—*The Glasgow News* says there is a prospect of a full dress debate taking place soon at the Glasgow Town Council on the question of congested traffic. Many proposals will be discussed in conjunction with the report on tramway fares when that subject comes up for review.

Wages at Birmingham.—The discussion on the wages question between Birmingham Corporation and representatives of the navvies and labourers employed on the tramways is still proceeding. At a recent meeting the men resolved to adhere to their demand of 1s. 5d. per hour instead of 1s. 3·66d.

Track Renewal at Nottingham.—A substantial beginning has been made with the work of renewing the tramway lines in Radford Road, Nottingham. Other routes are to follow. It is stated that the cost will be 150 per cent. more than it would have been in pre-war days.

Material for Tramway Work.—In a letter to the Halifax Corporation Tramways Committee, the Municipal Tramways Association said that from past experience they were of opinion that it was not desirable to ask the Government department to fix prices for materials for tramway work.

Training Employees at Nottingham.—In reply to a question at a meeting of the Nottingham City Council, Mr. R. H. Swain, chairman of the Tramways Committee, said that driving was learned in the men's own time. The conductors were sent to a school for three days, and were paid £1. If not then efficient, they had three more days' training and were paid another £1.

Belfast Deputation to Study Cars.—In order to obtain first-hand information as to the latest types of cars, Alderman Tyrrell and Councillors Turner, M'Donald, Andrews and Dempsey, with the general manager (Mr. J. S. D. Moffet), have been appointed a committee to visit Liverpool, Manchester, Sheffield, Leicester, Loughborough, Nottingham, London and Birmingham.

Tramway Industrial Council.—The Newcastle City Council have approved the report from the Tramways Committee recommending the scheme for a central Industrial Council of Tramway Employers and Workers, in accordance with the recommendations of the Whitley Report. The full constitution of the Joint Industrial Council for the Tramway Industry was given in our issue of March 13th, 1919.

Women Released at Liverpool.—All women conductors have been released from service on the Liverpool Corporation tramways. The first women conductors were employed in 1916, and since then 1,500 women have been employed, mostly as conductors, but some as car cleaners and in the electrical workshop. The Tramways Committee has expressed great satisfaction with the work the women have done.

West Hartlepool Tramways Bill.—The House of Lords Examiner of Standing Orders Approved has considered the petition of the West Hartlepool Corporation for leave to deposit a Bill authorising the construction of tramroads and tramways and street works, and to provide and work omnibuses within and beyond the borough. As the Bill was late, the Examiner found non-compliance with the standing orders, and it was referred to the Select Standing Orders Committee.

L.C.C. Tramway Bill.—The Middlesex County Council has decided to oppose the tramway bill of the London County Council, which includes application for powers to run services of motor omnibuses beyond the London area. Sir Herbert Nield, M.P., said it was an attempt by the London County Council "to jump a claim," and to compete with the Middlesex County Council, which already had a municipal undertaking covering part of the area, and could provide additional transport.

Runaway Car at Pontypridd.—A Pontypridd tramway car ran away on May 4th on Cornstore Hill. When the car approached the Old Bridge it rounded a difficult curve in spite of the fact that it was going at high speed, but at Taff Street it jumped the rails and crashed into a shop, which was wrecked. The car was thrown from the track and came to a standstill, without completely overturning, at right angles to the track, where traffic was blocked for some time. Fortunately, there were no passengers in the car and both the driver and conductor escaped injury.

Birmingham Tramway Bill Approved.—A meeting of Birmingham ratepayers on May 2nd approved a Bill to be promoted by the Corporation for the extension and improvement of the tramway system. The Lord Mayor (Sir David Brooks) said it was proposed to construct a new type of tramway on the sleeper-track principle. It would be in the middle of the roadway, but would be on a higher level, crossings being provided at frequent intervals for vehicular traffic. The sleeper-track system would ensure less noise and vibration, and conduce to more rapid and comfortable travelling. Some discussion took place on a clause of the Bill which provides for a penalty for trespass on the sleeper-track tramway except for the purpose of crossing it at specified points.

Hull Tramway Management.—Hull City Council, at a meeting held on Thursday, May 1st, received the report of the Tramways Committee accepting the resignation of Mr. W. J. McCombe, manager of the tramways department. A special committee composed of seven members of the Council was appointed to investigate the management of the tramways department. On Monday a special Meeting of the City Council, called by requisition, will consider a resolution that the Tramways Committee should resign *en bloc*. There is a feeling in the city that the Committee has in some measure forfeited public confidence by the way it has dealt with so-called "irregularities" which brought about the resignation of the tramway manager.

Overcrowding of Omnibuses and Tramcars.—In reply to a question by Mr. Higham, the Home Secretary said that he was well aware of the overcrowding of omnibuses and tramway cars in London. It had been necessary to allow a limited number of excess passengers to meet the shortage existing by the withdrawal of omnibuses for military use, and by the impossibility of replacing worn out vehicles during the war. The police have temporarily reduced their requirements with regard to the vehicles to the lowest possible point consistent with safety, in order to allow as many vehicles as possible to continue to run. Neither he nor the Commissioner of Police was responsible for the supply of vehicles, but the Commissioner had reason to believe that the operating concerns were doing their utmost to cope with the situation.

Free Passes as Hospitality.—At a meeting of Belfast Corporation on May 1, Mr. O. Jameson protested against a resolution to grant delegates and their wives attending the National Commercial Temperance League annual conference in the city from May 16th to May 20th free passes on the cars. Those people were as well able to pay as any others. He would move that the members of the Christadelphian Society, who were coming in three months' time, and who, doubtless, were also teetotallers, be extended a similar privilege. (Laughter.) It had taken him some months to get the privilege of free passes for the blind. He moved that the matter be sent back to the committee. Alderman Tyrrell said members of the Convention, the Labour Congress, and other bodies, had been extended free passes as an act of hospitality, and he himself had been extended a similar privilege on visits across the water. The motion was withdrawn.

London Omnibus Fares.—The Home Secretary, in reply to a question of Mr. Higham, said he was making inquiries as to the increased omnibus fares in London, and the London General Omnibus Company had agreed to place the fullest information at his disposal. When asked by Mr. Higham why it was in the power of the Home Secretary to fix taxi-cab fares, while he had no power to fix omnibus fares, Mr. Shortt replied that it was because Parliament had so appointed it. Mr. Archer-Shee asked the Home Secretary if he would use his influence with the Board of Trade to have the whole question referred to a Joint Select Committee of both Houses, but no answer was given. A few days later Mr. Higham asked the Home Secretary if he had commenced his inquiry into the reason for the increased omnibus fares in London. Mr. Shortt replied that he had obtained full details from the London General Omnibus Company, and he proposed to submit them to an eminent accountant to report on the question whether the increase in fares was justified.

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London Traffic Improvement.—Mr. Frank Pick, Commercial Manager of the Underground Railways Company, has stated that 62 cars for the Tube Railways are on order, and that tenders have been invited for 100 District Railway coaches as a first instalment. A new type of omnibus has been designed and the building of the new vehicles will begin in about two months. At present 250 omnibuses of the type now in use are being manufactured. Extensions of the Hampstead Tube to Hendon, the enlargement of the City and South London Tube from narrow to standard gauge, and the coupling up of that line and the Hampstead and Highgate line are proposed. To carry out existing unfinished schemes will require an estimated expenditure of £3,000,000. "The crux of the whole question of traffic difficulties in London," said Mr. Peck. "is rolling stock. The hardest thing to buy to-day is a passenger car."

Liability for Accidents.—An interesting decision was given by Judge Parfitt in Leeds County Court on May 1st, in an action brought by a railway goods guard against Leeds Corporation for damages. It was stated that the trolley head of a car on which plaintiff was a passenger came off and struck him, rendering him unconscious. The Judge held on the evidence that it was impossible to find that the defendants had been guilty of negligence. It ought to be more publicly known that the defendants were under no greater obligation to use reasonable care in the manipulation of their system than if it belonged to an individual. The obligation in law was that reasonable care must be taken to maintain the system in a condition of safety, and, in his judgment, the defendants had done so. Whether the owners of a tramway system were a corporation or private individuals they, under no circumstances, insured or guaranteed the perfect safety of the persons they carried. All they undertook to do was to use reasonable care to see that the safety of the public was provided for. Judgment was given for the defendants, but without costs, as the plaintiff had sustained serious injuries. The Corporation were exonerated from any sort of negligence whatever.

FINANCIAL.

Johnson & Phillips, Ltd.—A dividend is announced of 10 per cent. per annum on the ordinary shares for the year 1918.

Halley's Industrial Motors.—The directors of Halley's Industrial Motors, Ltd., announce an interim dividend of 5 per cent. actual, less tax.

Belsize Motors.—The report of Belsize Motors, Ltd., announces an interim dividend on the Ordinary shares of 4 per cent. actual, less tax.

Auckland Tramways.—A distribution is announced of 6d. per share, less tax, on account of dividend for the year ending June 30 next.

London United Tramways.—Further increases of fares on the London United tramways have been sanctioned by the Board of Trade, bringing the increases since 1914 up to 100 per cent.

City of Buenos Ayres Trams.—The directors of the City of Buenos Ayres Tramways Company (1904) have declared a dividend of 1s. 3d. per share (being at the rate of 5 per cent. per annum), less income tax, for the three months ended March 31st last, payable on 16th instant.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended May 7, amounted to £81,277, an increase of £22,712, as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1st (the commencement of the financial year) to May 7 (five weeks and two days) the total receipts were £406,682, an increase of £109,585 on the corresponding period of 1918.

Oldham, Ashton and Hyde Tramways.—The revenue for the year 1918 amounts to £50,704, and expenditure (including £1,178 for debenture interest) to £33,347, leaving a net profit of £17,357, and £3,100 was brought in, making £20,457, which is thus disposed of: To reserve £10,000 (raising it to £54,514); £5,500 further dividend on ordinary, making 6 per cent.; forward, £4,957. Arrangements are being made to refer to arbitration, in accordance with the provisions of the Tramways Act, 1870, the question of the price to be paid to the company by the various purchasing local authorities

Nottingham Tramway Estimates.—It is expected that the Nottingham Tramways Committee will provide at least £20,000 in relief of rates, which is an increase of £4,000 compared with last year. The tramway revenue, after paying working expenses, amounts to about £100,000, and the Committee will be asked to give more than £20,000 in order to keep the increase in rates within the 2s. 6d. basis. The tramways have had a record year, the total receipts amounting to over £300,000, or an increase of £70,000 on last year.

Blackpool Corporation Tramways.—The report by Mr. Charles Furness, the manager, shows that for the year ended March 31st last the revenue was the highest on record, namely, £140,929, as against £119,339 in the preceding year. The total expenditure was £90,003. Interest and redemption of loans absorbed £20,844, which left a disposable balance of £30,052, as compared with £31,518 in the previous year. The decrease in the available balance (notwithstanding such an advance in the total receipts) is accounted for by the higher wages and the high cost of materials. The number of passengers carried was 23,279,202, being three million more than in the preceding twelve months. The aggregate car mileage was 1,242,108, and the receipts per car mile 2s. 2½d., being 5d. more than in 1918.

British Westinghouse Electric and Manufacturing Co., Ltd.—The report for the year ended December 31st shows that the sum available for the year, including the balance of £51,534 brought from last year's account, amounts to £198,152. The following appropriations have been made: To special depreciation of plant, machinery, etc., £42,315, dividend on cumulative preference shares as 8 per cent., less income tax, £78,090, balance carried forward, £77,747. The report states that during the year Mr. Lincoln Chandler has resigned the position of managing director, but retains a seat on the board. Captain R. S. Hilton has been appointed managing director. In accordance with the undertaking given by the Metropolitan Carriage, Wagon and Finance Company, Ltd., 1,000,000 ordinary shares of the company have been applied for, and they were allotted for cash at par on April 14th.

PERSONAL.

Mr. Tarbert, cashier of Hull Corporation tramways, has been appointed manager *pro tem.*

Mr. E. B. Wedmore has been appointed as Director of Research by the Electrical Research Committee.

Sir Albert Stanley, President of the Board of Trade, has not yet recovered from his indisposition. It is reported that he is desirous of retiring from Parliament in September next.

Mr. R. Q. Robertson has been appointed manager of White Motors and Accessories, Ltd., in succession to Mr. W. J. M. Bell, who has severed his connection with the company.

Mr. E. W. Sleight has resumed his duties as manager of the Carlisle Tramways Company, on returning from the Army. He served in the Royal Fusiliers and King's Own Lancashire Regiment, and was severely wounded.

Lieut. L. C. Bellamy has been selected for the position of manager of the St. Helens Corporation tramways, and will begin duty when the undertaking has been transferred to the Corporation in October next. Lieut. Bellamy is the eldest son of the late Mr. C. R. Bellamy, general manager of the Liverpool Corporation tramways. After spending some time in the office of the Liverpool tramways, he became assistant manager of the St. Helens tramways, and later was for two years assistant manager of the Rangoon Tramways Company. On returning to England, he was appointed general manager of the Ilkeston Corporation tramways and electrical undertaking, leaving that post when the war broke out to join the Royal Engineers. He has seen service in Gallipoli, France and Belgium, and was awarded the M.C.

Mr. L. Coatalen, chief engineer and joint managing director of the Sunbeam Motor Car Company, Ltd., Wolverhampton, proposes to concentrate his attention solely on the design of cars, aeroplane engines, airship and motor boat engines. Mr. Coatalen has tendered his resignation as joint managing director, and the directors have agreed with his view that it is wise to dissociate the combined duties of joint managing director and chief engineer. Mr. Coatalen will, therefore, become chief engineer of the company, and be responsible for the design of the Sunbeam Company's productions while retaining his seat on the Board of Directors. On April 15th Mr. Coatalen sails for America to study the conditions of motor manufacture and production in the United States. Mr. W. M. Iliff, who was joint managing director with Mr. Coatalen, will now be sole managing director.

We regret to record the death of **Mr. W. E. Blake,** Superintendent of the Line of the Underground Electric Railways, which occurred on Thursday evening at St. George's Hospital, after an operation. Some weeks ago Mr. Blake, while directing the removal of a derailed car, fell and received a slight injury to his leg. Septic poisoning resulted and it was necessary to amputate his leg. Mr. Blake, who was 55 years of age, went to the District Railway as a boy of 16. He had seen the traffic increase from 16 trains an hour in the old steam days to over 50.

THE
ENGLISH ELECTRIC COMPANY
LIMITED.

Queen's House, Kingsway, London, W.C.2.

This Company, with a Capital of £5,000,000, has been formed to consolidate under one direction and management the various interests of the following companies, in all of which a predominating control exists:—

COVENTRY ORDNANCE WORKS, LTD.
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TRAMWAY TRACK CONSTRUCTION AND MAINTENANCE.

By R. BICKERSTAFFE HOLT,
Late Highways and Permanent Way Engineer,
City of Leeds.

CONTENTS:

FOREWORD.
What's wrong with the Track?"

CHAPTER I.—CONCRETE FOUNDATIONS.
Defects—Causes of fracture—Method of laying concrete.

CHAPTER II.—CONCRETE MATERIALS.
Road metal—Water-gravel—Sand—Clinker-sand—Trass.

CHAPTER III.—REPAIRS TO CONCRETE FOUNDATIONS.
Patching—Partial repairs—Complete renewal.

CHAPTER IV.—TRACK DESIGN.
"Follow my leader" policy—Importance of local conditions—Effect on sub-soil—Standard methods—Transverse sleeper tracks—Effect of vehicular traffic and tramway car traffic.

CHAPTER V.—RAIL PACKING.
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CHAPTER VII.—JOINTS, FISH PLATES, BOLTS AND NUTS.
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CHAPTER VIII.—JOINT WELDING.
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CHAPTER IX.—RAIL WEAR.
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CHAPTER X.—COMPOSITION AND MANUFACTURE OF TRAMWAY RAILS AND RAIL WEAR.
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CHAPTER XIV.—SURFACE DRAINAGE AND RAIL MAINTENANCE.
Rail cleaning—Rail grinding—Rail planing.

CHAPTER XV.—SPECIAL TRACK WORK.
Design and standardisation of points—Unbroken main line crossings—Renewable plates—Switches—Mechanism for movable points—Heel pins—Tongue heel adjusters—Guard rails—Spiral tables for curves and junctions—Special track problems.

250 pages, 10 × 6½ × 1 in., with over 150 illustrations.

Price 12s. 6d.

TRAMWAY AND RAILWAY WORLD OFFICES,
AMBERLEY HOUSE, NORFOLK STREET, LONDON, W.C.2.

CONTRACTS AND ORDERS.

Manchester Corporation Gas Committee have purchased two tipping wagons from the Sentinel Wagon Works, Shrewsbury.

John Brown & Co., Ltd., have an order from Halifax Corporation for twenty-five tramcar wheel tyres at a price of £45 per ton. Brown Bayley's Steel Works, Ltd., are to supply the same number at the same price.

Hadfield, Ltd., of Sheffield, have received an order for the supply of special work from York Electricity and Tramways Committee.

Messrs. Hurst, Nelson & Co., Ltd., of Motherwell, have received an order from Edinburgh Tramways Committee for forty top covers for tramcars, at £457 each.

Edinburgh Tramways Committee have accepted tenders for twelve motor omnibuses at a cost of £1,431 each, and three chars-à-bancs at £1,341 each from Messrs. Leyland Motors, Ltd., Leyland, Lancs.

The Stirling Boiler Company's tender for three water-tube boilers for the central power-house at Stoke-on-Trent, at £29,000, has been accepted by the Electricity Committee.

London Cars for Blackpool.—Blackpool Corporation propose to purchase six second-hand tramway cars from the London United Tramways Company.

Leicester Corporation.—The erection of a transformer house containing two 1,000 kw. rotary converters is recommended, at an estimated cost of £18,000. Messrs. Dick, Kerr & Co.'s tender for the plant was accepted early this year.

TENDERS INVITED.

WARRINGTON CORPORATION TRAMWAYS.

Advertising on Cars.

The Council invite tenders for the rights of Advertising on the Corporation Tramcars. Form of Tender and Contract may be obtained on application to the Tramways Manager, Mersey Street, Warrington.

Tenders endorsed "Tramcar Advertising" and addressed to the Chairman of the Electricity and Tramways Committee, Town Hall, Warrington, to be delivered not later than 12 o'clock noon, Tuesday, May 20th, 1919.

A. T. HALLAWAY,
Town Clerk.

Town Hall, Warrington.

POSITIONS VACANT.

BOROUGH OF KEIGHLEY.

Electricity and Tramways Departments.

Appointment of Assistant to the Borough Electrical Engineer and Tramways Manager.

Wanted, a thoroughly capable Assistant for carrying out instructions in connection with both the Electricity and Tramways Departments.

He should be capable of controlling men, and have a good mechanical and electrical knowledge.

Preference will be given to those also having Tramway experience and the supervision of Mains work.

Commencing salary £200 to £300 per annum, inclusive of all War Bonuses and Awards to date, according to qualifications.

Applications in writing for the above appointment to be received not later than Monday, the 19th of May, stating age, training, experience, together with copies of three recent testimonials, to the undersigned.

HARRY WEBBER,
Borough Electrical Engineer and Tramways Manager.

Electricity Offices,
Coney Lane, Keighley.

TO TRACTION ENGINEERS.

A large Electrical Manufacturing Concern has a vacancy for an Engineer with long experience of heavy electric traction control, to take full charge of the designing and draughting departments for this class of work. Only thoroughly capable men need apply, and the position, which is permanent, is sufficient to attract a man of high ability.

Applications should include a full statement of the designing and manufacturing experience of the applicant, together with his technical and practical training, date services available, and salary required, to Box No. 58, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

Assistant Ticket Superintendent Wanted on large Municipal Tramways. Salary and Bonus, £3 10s. per week to commence. Must be well educated and eperienced in the duties of supervising large staff of girls on similar class of work.—Apply Box 59, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

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PRICE LIST OF TRAMWAY AND OMNIBUS SHARES.

Dividends Prev.	Dividends Last.	Name.	Paid.	Price, July 27, 1914.	Cash May 8 or previous.	Cash Apr. 30 or previous.
5%	5%	Alabama Traction 5% 1st Mt. ..	—	67	66½	67¾
2/9	2/9	Anglo-Argentine 5½% 1st Pref.	5	4¼	61/3	62/6
2/9	2/9	Do. 5½% Cum. 2nd Pref. ..	5	4½	55/-	58/9
4%	4%	Do. 4% Deb.	100	91	68¼	68
4½%	4½%	Do. 4½% Deb.	100	98½	70½	70¼
5%	5%	Do. 5% Deb.	100	96	69	68¼
—	—	Associated Omnibus Co., Ord. ..	5/-	3/32	1/2	1/2
6d.	1/-	Auckland Elec. Trams. Ord. ..	1	1 5/32	19/6	19/3
5%	5%	Do. 5% 1st Mt. Deb. ..	100	102½	91	90
7%	7%	Barcelona Trac. 7% Pr. Lien ..	100	—	106½	107
—	1/-	Bath Electric Trams Pref. Ord.	1	¼	3/7½	3/7½
6d.	6d.	Do. 5% Cum. Pref. ..	1	3/16	10/-	10/-
4½%	4½%	Do. 4½% 1st. Mort. Deb. ..	100	72½	68½	68½
4½%	4½%	Birmingham Dist. Pwr. and Tract. Co. 4½% 1st Deb. ..	100	84½	72¾	72
14/-*	18/-*	Bombay Elec. Sup. & Tram Ord.	10	14	23 1/16	23 1/16 xd
6/-	6/-	Do. 6% Cum. Pref. ..	10	11¼	10 13/16	10 13/16
4½%	4½%	Do. 4½% Deb.	100	96	76½	78
5%	5%	Do. 5% 2nd Mt. Deb. ..	100	100	86	86
$1	$1	Brazilian Trac. & Power Ord. ..	$100	66	57¾	57½
$1½	$1½	Do. 6% Cum. Pref. ..	$100	97	93	92½
4/-	4/-	Brisbane Elec. Trams. Ord. ..	5	7½	97/6	97/6
2/6	2/6	Do. 5% Cum. Pref. ..	5	5	80/-	80/-
4½%	4½%	Do. 4½% 1st Deb. ..	100	101½	93¾	93¾
3%	3%	Brit. Col. Elec. Ry. Def. Ord. ..	100	107	31	33
6%	5%	Do. Pref. Ord.	100	106	38	35
5%	5%	Do. 5% Cum. Pref. ..	100	103	58½	58½
4½%	4½%	Do. 4½% 1st Mt. Debs. ..	40	99½	83½	83½
4½%	4½%	Do. 4½% Perp. Con. Deb.	100	96½	61	61
£8*	£8*	Brit. Elec. Trac. Ord.	100	—	43	42½
6%	6%	Do. 6% Cum. Part. Pref.	100	—	77½	79
5%	5%	Do. 5% Deb.	100	92	83½	82½
4½%	4½%	Do. 4½% 2nd Deb. ..	100	77½	66½	66½
5%	5%	B. A. Lacroze 5% Mt. Deb. ..	100	100	72½	74½
2/6	2/6	Calcutta Tramways Ord. ..	5	7½	7½	7¾
2/6	2/6	Do. 5% Cum. Pref. ..	5	5 1/16	77/6	77/6
4½%	4½%	Do. 4½% 1st Deb. ..	100	99½	72	72
1/-*	1/-*	Cape Elec. Trams.	1	11/16	15/-	15/-
1/3	1/3	City of B. A. Trams	5	5½	80/-	80/-
4%	4%	Do. 4% Deb.	100	97½	71½	71
5%	5%	Colombo Elec. Tram. & Ltg. Co. 5% 1st Mort. Deb.	100	95	77	79
5%	5%	Co. P.C. do. Jardin Botanico 5% 1st Mort. Bds.	100	93½	80½	80¾
5%	5%	Costa Rica Elec. Lt. & Trac. Co. 5% 1st Deb.	—	63½	57½	57½
4/-	7/-	Dublin United Trams. Ord. ..	10	8	7 1/16	7¾
6%	6%	Do. 6% Pref.	100	—	105	105
—	—	Hastings & Dis. Elec. Tram Ord.	10/-	1/16	1/1½	1/1½
1/2½*	1/2½*	Do. 6% Cum. Pref. ..	1	9/16	10/1½	10/1½
4½%	4½%	Do. 4% Deb.	100	67½	58¼	58¼
7d.	10d.	Hong Kong Tramway	5/-	5/16	23/6	23/6
5%	5%	Do. 5% Deb.	100	87½	98½	98½
2/6	3/-	Isle of Thanet 5% Pref. ..	5	2½	30/5½	30/5½
4%	4%	Do. 4% Deb.	100	73½	—	—
—	3%	Kalgoorlie Trams 6% B. Deb. ..	100	15	16	16
—	—	La Plata Trams. Ord.	1	½	2/-	2/7½
7/-	11/-	Lanarkshire Trams Co. ..	10	10½	£10/9/3	£10/9/3
5%	5%	Lancs. Un. Trams 5% Pr. Ln.	100	86½	77	77
5%	5%	Lisbon Elec. Trams 5% Mt. Debs.	100	95	71	71
7½d.*	10½d.*	Llandudno & Colwyn B. Ord.	1	—	12/-	13/6
—	1½d.	London & Sub. Traction Ord. ..	1	15/64	2/9	3/1½
6d.	6d.	Do. 5% Pref.	1	5/16	8/1½	8/-
4½%	4½%	Do. 4½% 1 Mt. Deb. ..	100	75½	58	57½
4½%	4½%	L.G.O. 4½% 1st Deb.	100	100	80½	83
5%	5%	Do. 5% Inc. Deb... ..	100	88½	78½	76¾
4%	4%	Lon. Unt. Trams. 4% 1st Mt. Db.	100	55	38½	38½
3/-	3/-	Madras Elec. 6% Pref. ..	5	5 1/16	82/6	82
5%	5%	Do. 5% Deb.	100	100	86½	86½
7½d.%*	9¾d.*	Manaos Trams & Ltg. Ord. ..	1	3/32	4/6	4/6
5%	5%	Do. 5% 1st Deb.	100	77	68	68
$1½	$1½	Manila Elec. R. R. & Light ..	$100	102	94½	95
4½%	4½%	Met. Elec. Trams. 4½% Deb. ..	100	85½	74	73½
5%	5%	Do. 5% Deb.	100	87	75½	77½
$1½	$1½	Mexico Trams. Common ..	$100	70	44½	45¾
5%	5%	Do. 1 Mt. 5% G.B. ..	—	84	59	59
—	—	Do. 6% Mt. Bds. ..	100	76	47	47
4½%	4½%	Montreal Trys. Co. 4½% Stg. Dbs.	100	100	95	95
4½%	4½%	Do. 4½% Stg. Debs. (1922)	100	99	93½	95½
2/-	1/2½*	National Steam Car	1	13/16	15/3	14/6
9¾d.*	9¾d.*	New General Traction	1	½	8/3	8/3
6d.	1/1½	Northern Gen. Trans. Ord. ..	1	21/32	20/-	19/11
3/-	4/-	Para Elec. Rlys. Ord.	5	4½	95/-	95/-
5%	5%	Do. 5% 1st Deb.	100	89½	82	83½
—	—	Pernambuco Tram. & Power Ord	1	—	8/3	8/1½
—	8¾d.	Do. 7% Non. Cm. Part Pf.	1	—	15/3	15/6
5%	5%	Portland Ry. 5% 1st Mt. 30 yr.	—	96	—	—
8¾d.*	8¾d.*	Potteries Elec. Trac. Ord. ..	1	1½	11/6	11/6
6d.	6d.	Do. 5% Pref.	1	13/32	12/-	12/6
8d.	1/4	Provincial Trams. Ord. ..	1	½	19/10½	19/10½
3/-	3/-	Rangoon Tram. 6% Cum. Pref.	5	5½	81/6	81/6
5%	5%	Rhondda Trams. 5% 1 M. Deb.	100	88	79½	79½
5%	5%	Rio de Janeiro Try. & Pr. 1st Mt. 30 yr. 5% Gld. Bd. '35 ..	—	97½	94½	94½
5%	5%	Do. 1st Mt. 5% 50 yr. ..	100	89½	81½	81½
5%	5%	Sao Paulo Deb. 5% 1st Mt. ..	$500	99	93½	94
5%	5%	Do. 5% Perp. Deb. ..	100	99½	80½	80½
15/-	10/-	Shanghai Elec. Cons.	10	13	14 1/16	14 1/16
3d.	3d.	Singapore Elec. Trams. ..	5/-	¼	3/11	4/-
4%	4%	Sou. Met. Elec. Tram & Ltg. 4% Db	100	66	55	54
5%	5%	S. Elec. Trams. of B.A. 5% Mt. ..	—	100½	99¾	99¾
4½%	4½%	Toronto 1st Mt. 4½% Bds. ..	100	98	94½	94½
4½%	4½%	Tramways (M.E.T.) Omnibus 4½% Debs.	100	91	75	75
2/-	2/-	Un'd. El. Tr. Monte Video Ord.	5	4½	60/-	60/-
4½%	4½%	Winnipeg El. 4½% Deb. ..	100	94½	68	68
—	—	Yorks (W.R.) Elec. Trams. Ord.	5	½	25/4½	25/4½
3/-	3/-	Do. 6% Cum. Pref. ..	5	½	77/6	77/6
4½%	4½%	Do. 4½% 1st Deb.	100	85	73	73
—	—	Metropolitan Dist. Ord. ..	100	21½	25½	22½
—	—	Undgd. Elec. Rys. of London ..	10	21½	53/9	62/6
		Do. "A"	1/-	½	9/-	9/-
4½%	4½%	Do. 4½% Bds. of 1933 Rd.	—	99	103¾	103¾
6%	6%	Do. 6% 1st. Cum. In. Db.	100	114	101½	101
%	4%	Do. 4% In. Bonds Rd. ..	—	85	95½	95½

* Indicates dividend for the year. In other cases the dividend is for the half-year.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1917-18	1918-19	Incr. or Dec.	Aggregate. Wks.	1918-19	Incr. or Dec.
Aberdare U.D.C. ..	Apr. 22	460	769	+ 309	3	1,880	—
Aberdeen Corporation ..	„ 30	2,283	2,769	+ 486	48	125,490	+ 20,983
Ayr Corporation ..	May 3	415	499	+ 84	49	28,694	+ 6,024
Birkenhead Corporation	„ 4	2,100	2,365	+ 265	42	11,626	+ 1,678
Blackburn „ ..	Apr. 30	1,792	1,977	+ 185	52	12,195	+ 3,461
Bradford Corporation ..	„ 26	7,527	13,612	+ 6,085	4	42,951	+ 12,896
Burnley Corporation .	May 3	2,059	2,955	+ 896	..	..	..
Burton-on-Trent Cor. ..	„ 4	379	463	+ 84	5	2,211	+ 366
Bury Corporation ..	„ 4	1,771	2,219	+ 448	52	12,042	+ 3,429
Chatham & District ..	Apr. 24	1,170	1,794	+ 624	16	20,785	+ 1,637
Cork Electric	„ 24	495	710	+ 215	16	8,996	— 614
Derby Corporation ..	May 3	1,398	1,531	+ 133	5	7,849	+ 991
Dundee City	Apr. 30	1,621	2,151	+ 530	50	99,275	+ 20,605
East Ham Corporation ..	May 3	1,365	1,693	+ 328	4½	8,757	+ 2,688
Glasgow Corporation ..	„ 3	28,068	31,608	+ 3,540	48½	1,391,788	+ 105,816
Glossop (U.E. Sup. Co.) ..	„ 3	178	218	+ 40	18	3,944	+ 733
Halifax Corporation ..	Apr. 29	2,643	3,071	+ 428	4½	14,832	+ 4,028
do. Motor Buses ..	„ 29	56	71	+ 15	4½	335	+ 95
Huddersfield Corporation	May 3	3,475	4,339	+ 864	5	23,621	+ 6,068
Ilford U.D. Council ..	„ 3	931	1,081	+ 150	5	5,499	+ 1,255
Ipswich Corporation ..	„ 3	647	719	+ 72	5	3,801	+ 735
Isle of Thanet ..	„ 3	199	624	+ 425	30½	11,817	+ 6,182
Kilmarnock Corporation	„ 3	225	288	+ 63	50½	13,591	+ 2,917
Lanarkshire	Apr. 24	3,575	861	— 2,714	16	53,006	— 665
Leeds City	May 3	11,357	15,189	+ 3,832	5	78,301	+ 25,832
Leicester Corporation ..	„ 3	4,389	5,393	+ 1,004	..	..	..
Leyton U.D. Council ..	„ 1	1,901	2,580	+ 679	5	14,621	+ 5,181
Liverpool Corporation ..	„ 3	17,992	21,654	+ 3,662	17½	364,351	+ 68,750
Llandudno & Colwyn Bay	Apr. 25	332	819	+ 487	21	7,039	+ 1,399
London County Council ..	„ 7	58,565	81,277	+ 22,712	5½	406,682	+ 109,585
Maidstone Corporation ..	May 1	212	306	+ 94	4½	1,777	+ 426
Manchester Corporation	„ 3	24,885	29,026	+ 4,141	5	144,673	+ 31,574
Newcastle-on-Tyne Cor.	„ 3	8,749	8,730	— 19	5	43,073	+ 2,227
Northampton Cor. ..	Apr. 28	873	1,522	+ 649	4	4,558	+ 1,157
Nottingham Corporation	May 1	5,618	6,668	+ 1,050	5	31,416	+ 7,059
Oldham Corporation ..	Mar. 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation ..	May 1	1,187	1,363	+ 176	4½	6,658	..
Rhondda Tramways .	Mar. 20	1,633	2,150	+ 517	11	23,210	+ 5,603
Rotherham Corporation	May 7	2,020	2,253	+ 233	5½	12,269	+ 1,389
Sheffield Corporation .	„ 4	13,279	16,614	+ 3,335	5½	96,777	+ 21,667
Southampton Cor. .	Apr. 30	2,397	2,436	+ 39	4½	11,489	+ 852
Southend-on-Sea Cor. ..	„ 30	730	1,424	+ 694	5	7,259	+ 4,000
South Shields Cor. ..	„ 26	1,059	1,601	+ 541	4	5,358	+ 1,419
Sunderland Corporation.	May 4	2,034	2,682	+ 648	5	13,966	+ 3,763
Swindon Corporation	Apr. 30	321	296	— 25	4½	1,393	+ 148
Torquay Tramways .	„ 24	785	1,507	+ 722	16	13,030	+ 1,473
Tyneside Trys. & Trmrds	„ 23	908	1,618	+ 710	17	14,526	+ 304
Wallasey Corporation	May 3	1,696	2,232	+ 536	4½	11,540	+ 3,562
Walsall Corporation ..	„ 3	1,181	1,392	+ 211	5	6,910	+ 1,159
Waithamstow U.D. Coun.	„ 3	1,311	1,483	+ 171	5	8,564	+ 2,716
Warrington Corporation	Feb. 20	725	851	+ 126	51	39,949	+ 8,793
West Ham Corporation	May 1	4,009	4,907	+ 898	42	23,709	+ 5,820
Wigan Corporation .	Jan. 2	2,367	2,424	+ 77	30	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine ..	Apr. 29	£57,721	£65,483	17	£984,067	+ £46,393
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Mar.	3,803	3,051	48	42,131	+ 1,444
Brazilian Traction (Mlrs.)	Feb.	7,315,000	7,972,000	8	16,494,000	+ 1,342,000
Brisbane	Feb.	32,009	34,380	8	72,955	+ 6,446
British Columbia .. $	Mar.	510,892	649,120	39	5,390,119	+ 894,848
Buenos Aires Lacroze ..	Apr.	41,643	43,607	43	434,186	+ 46,122
Burmah Tram. & Light Rs.	Mar. 31	27,906	38,440	34	289,170	+ 77,029
Calcutta .. .. Rs.	Apr 26	71,869	80,494	16½	1,410,741	+ 201,016
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Apr.	4,210	1,786	17	10,192	— 7,366
Cordoba	Jan.	12,844	13,942	44	145,654	+ 10,915
East India	Apr.	1,791	1,920	39	17,548	+ 5,261
Hong Kong .. .. $	Mar. 15	12,349	13,100	11	158,224	+ 4,479
Kalgoorlie	Dec.	3,044	2,848	52	33,686	+ 1,078
La Plata	Apr.	5,169	5,630	17	23,650	- 3,677
Lima	Feb.	41,921	46,082	8	91,444	+ 5,962
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Apr. 30	42,911	44,706	17	271,568	— 49,156
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	+ 53,950
Manila .. .. $	Jan.	167,000	231,585	4	231,585	+ 4,585
Montevideo	Mar.	36,659	41,070	21	190,891	+ 18,558
Para	Mar.	24,848	26,022	17	97,585	+ 3,164
Pernambuco ..	May 4	4,441	5,566	17½	95,369	+ 12,603
Peruvian .. $	Feb.	925,410	948,470	34	7,973,835	— 229,195
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Apr.	5,885	6,217	17	25,817	+ 2,954
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore .. .. $	Mar. 15	14,161	16,307	11	178,525	+ 31,018
Toronto .. .. $	Mar.	1,113,472	1,083,285	13	3,205,922	+ 42,198
Winnipeg $	Mar.	307,289	384,937	13	1,146,638	+ 205,808

WANTED.

COPIES OF "THE TRAMWAY AND RAILWAY WORLD."

Issues of January 1 and 13, 1916, and August 16 and October 18, 1917, to complete files for binding.

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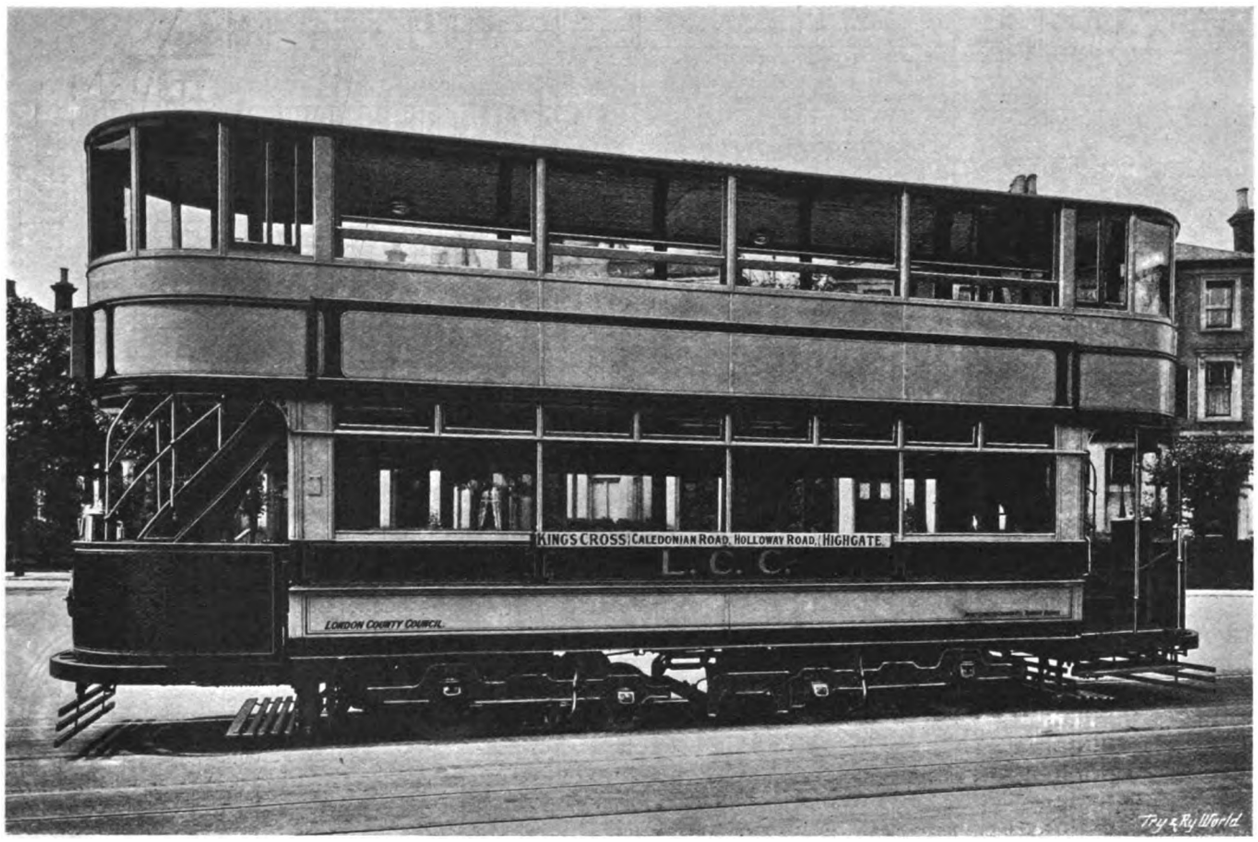
THE Tramway & Railway World
WITH MOTOR TRAFFIC SECTION

Founded 1892. LONDON, MAY 15, 1919. VOL. XLV.

LONDON COUNTY COUNCIL'S STANDARD TRAMWAY CAR.

The rolling stock of the London County Council Tramways has been obtained under different contracts executed at intervals from the time the first lines were reconstructed for electric traction in 1902-3 down to 1910. In consequence of this, and of the changes suggested by experience, several types of cars are now in use, but the greater number are of the London County Council standard type, which is shown in the accompanying illustrations. These cars have been built to the designs and specifications of Mr. A. L. C. Fell, general manager, and they were specially constructed to meet the traffic conditions in London. In reply to a question at a recent meeting of the Council by Mr. J. D. Gilbert, M.P., asking whether the present standard car was the most suitable type, Mr. W. J. Squires, chairman of the Highways Committee, replied that the present type had been chosen after careful study of the cars used in other cities, and in view of the traffic conditions in the Metropolis it was still considered the best type. This is a striking testimony to the care which was devoted to the determination of the standard type some years ago, and we think it is the general opinion that the type is on the whole well adapted to meet the exacting conditions under which the County Council have to run their cars. Throughout the whole London police district the tramway authorities have to observe the regulations of the Commissioner of the Metropolitan Police, which are more stringent than the regulations elsewhere.



The London County Council Standard Bogie Car.

It was finally decided that a double bogie type of car, with an enclosed top deck extending the full length of the roof, was the most suitable type. In the case of London, the question of obtaining the largest possible seating capacity in a car in proportion to its length is of very great importance. The Metropolitan police authorities in normal times, under the Police Carriage Act, refuse to allow any passengers on a car in excess of the number for whom seats are provided. After devoting considerable study to the question, it was found possible to construct a car measuring

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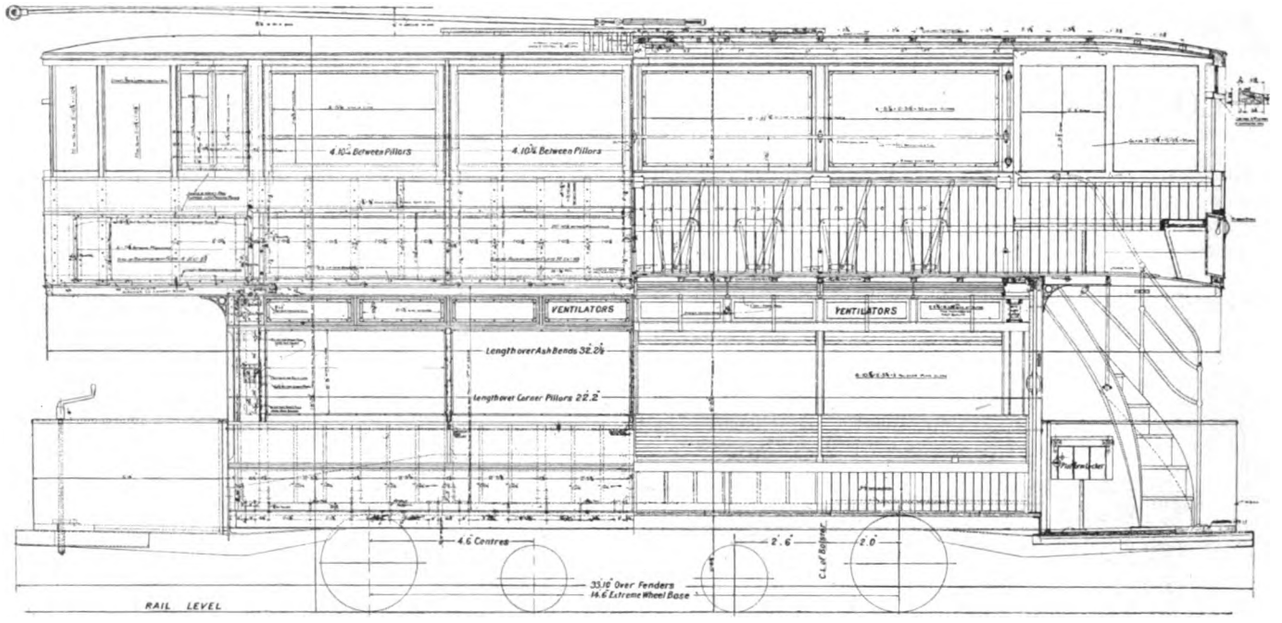
33 ft. 10 in. over the fenders, which accommodates 78 passengers, an increase of 12 passengers over the number provided for in the first cars constructed by the Council, the seats for the additional passengers being obtained by utilising the space above the staircase opening on the upper deck. Another condition which gave rise to some difficulty was that the space available under certain railway bridges which cross some of the tramway routes made it essential that the over-all height of the cars should be kept to a minimum.

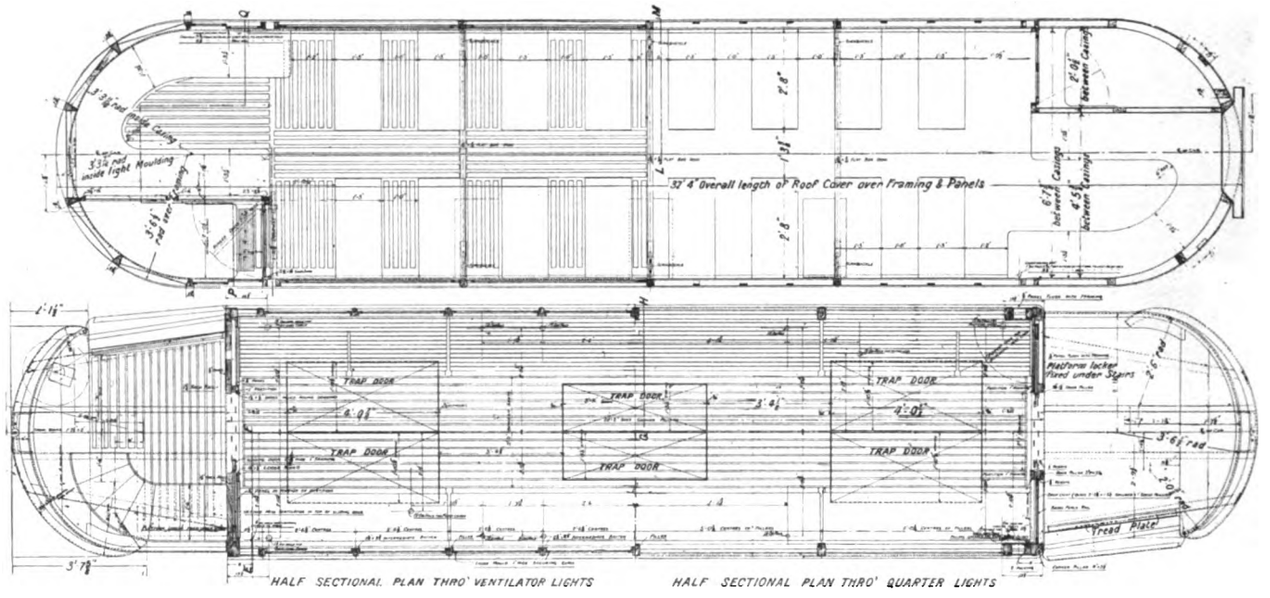
stress likely to be placed upon it. Stiffness is obtained transversely by suitable pressed steel brackets joining the transverse members of the underframe to the trussed plates and the main framing of the car body.

The principal dimensions of the standard car are as follows :—

Length over fender	33 ft. 10 in.
Length of body outside	22 ft. 2 in.
Width over guard rails	6 ft. 10 in.
Width outside over roof	7 ft. 2 in.



Elevation and Half Section of Standard Car.



Plans of Upper and Lower Decks of Standard Car.

In the construction of the standard car special attention was given to obtaining stability and strength to resist distortion, in view of the heavy mileages run and the loads to be carried. With this end in view, the underframe is constructed throughout of rolled and pressed steel members, and the tendency of the body to deflect at the ends is resisted by means of a steel plate 2 ft. deep by ⅜ in. in thickness, strongly rivetted to each of the channel steel sole bars of the underframe. This plate extends the full length of the car body, and is calculated to withstand the maximum

Height inside at centre from floor to under side of roof (head room)	6 ft. 2¾ in.
Height from floor to under side of roof cover (upper saloon)	6 ft. 2 in.

Destination indicators, mounted in teak weatherproof cases, are provided at each end of the car, and are placed just above the lower roof. The names are shown in white on dark-coloured geared roller blinds. Each car also carries in the end window of the upper saloon an illuminated service number to indicate the route on which it is travelling at the time. The life-

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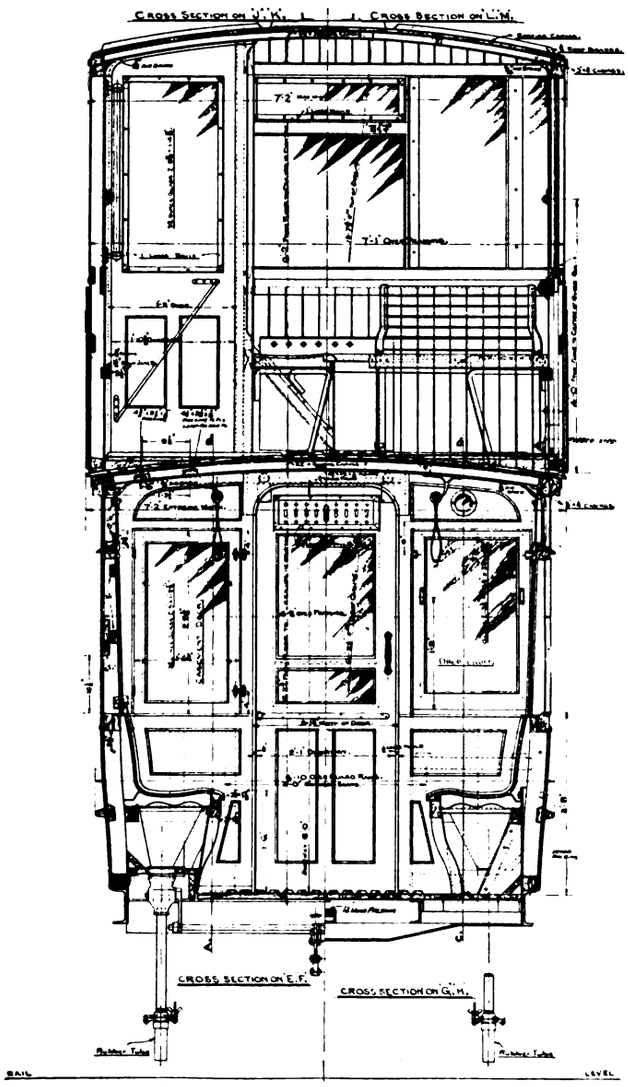
guards are of the swinging gate and tray pattern. The other fittings include at each end sand hoppers, a dash light, a foot gong, mechanical signal bells, a platform locker, lifting step, and hinged canopy boards bearing the word "Full" in large letters, which are exhibited when no more passengers can be taken. Every car carries an oak tool-box containing the following tools:—One feeder pillar key, one jack of 5 tons capacity, one 2-lb. hammer, one pair of hatch lifters, one screwdriver, one pair of pliers, one pair of india-rubber gloves, ash strips for putting ploughs in at live hatch, one adjustable spanner, one chisel, one shackle, one tin disinfectant powder, one plough lifting rope, and one wood block.

The following tools are also carried :—One crowbar with top end made to fit the jack, one point lever, one flexible steel tow-rope and hooks to which are attached by split link and chain two standard draw-pins.

The cars are lighted by circuits of 125 volt, 25-watt metallic filament lamps, with five lamps in series



Cross Section of Car.

arranged as follows :—Inside, 6; top deck, 6; head lights, 2; canopy lights, 2; destination indicators, 6; service Nos., 2; police traffic lights, 4.

Externally the cars are finished in Midland red and pale yellow, the initials "L.C.C." in large size being placed at the side of the car, and the car number on the dash plate.

The cars are mounted on bogie trucks of the maximum traction type with swing bolsters. These trucks were specially designed, and have been standardised

End View of Standard Car.

on the Council's system. The following are the dimensions :—

Wheel base of truck	4 ft. 6 in.
Distance between pivotal centres	13 ft. 4 in.
Minimum radius of curve to be negotiated	40 ft. 0 in.
Diameter of driving wheel on tread ...	2 ft 7¾ in.
Diameter of trailing wheels	1 ft. 9¾ in.
Diameter of driving axle	0 ft. 5 in.
Diameter of trailing axle	0 ft. 3¾ in.
Height from rail to top of side bearers ...	2 ft. 2⅝ in.
Distance of centre of pivotal point from centre of driving axle	0 ft. 7 in.
Maximum width over axle boxes	6 ft. 10 in.

One truck on each car supports the plough carrier, which consists of two side brackets bolted to the truck and two transverse channels in which the plough is free to slide. Steel-tired wheels are used.

The motors, of which one is mounted on each truck, are capable of accelerating a double-deck car, weighing approximately 18 tons when loaded, at the rate of 2 ft. per second on the level up to a speed of twelve miles an hour. Each motor is capable of developing an effective tractive effort on the periphery of the driving wheels of 1,300 lb. at the rate of twelve miles per hour. In addition to their traction use, the motors operate the Westinghouse electro-magnetic brakes, which are used as service brakes.

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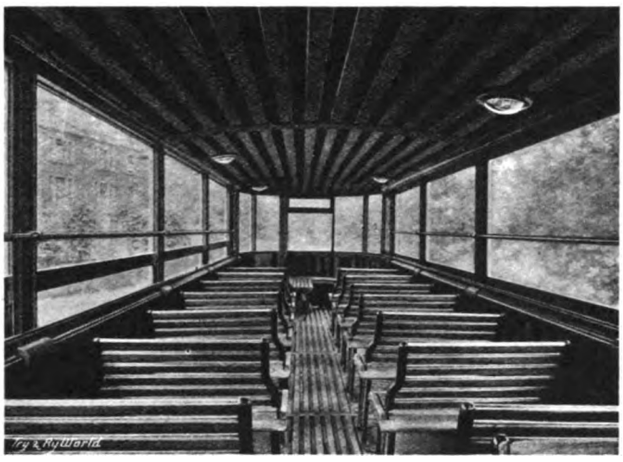
There are now a number of places on the tramway system where the cars run from the conduit to the overhead system, and many of the cars are provided with trolley booms and wheels.

In addition to the standard bogie car, the Council possesses a number of four-wheel double-deck cars of an earlier type, and 50 steel single-deck cars which are run on the service through the tramway subway, which affords connection between the northern



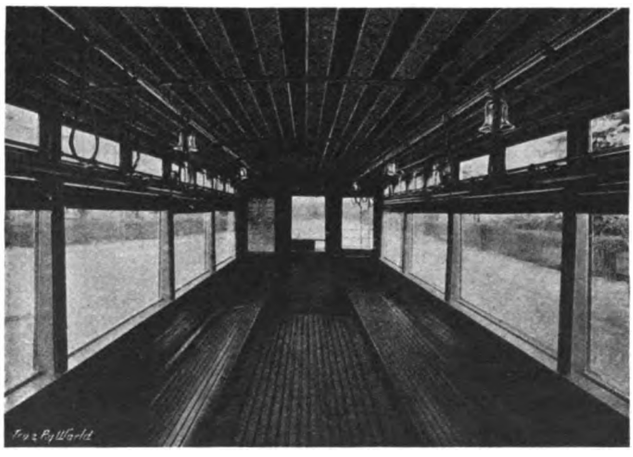
L.C.C. Standard Car—Upper Saloon.

and southern tramways. These cars are entirely built of steel. There are also a number of trailer cars.

The total rolling stock of the County Council now consists of the following :—

Cars.	
Bogie cars	1,375
Single truck cars	242
Steel subway cars	50
Trailer cars	158
Other Tramway Rolling Stock.	
Stores transport vans (electric)	8
Water vans (electric)	4
Rail grinder (petrol)	1

The car bodies have been built for the Council at various times by Dick, Kerr and Company, Limited,



L.C.C. Standard Car—Lower Saloon.

the Brush Electrical Engineering Company, Limited, Hurst, Nelson and Company, Limited, and Mountain and Gibson. The electrical equipments have been provided by Dick, Kerr and Company, Limited, the British Westinghouse Electric and Manufacturing Company, Limited, and the Brush Electrical Engineering Company, Limited.

TOOLS FOR PERMANENT WAY MAINTENANCE OF ELECTRIC RAILWAYS.

By E. Capone.

The work involved in carrying through the electrification of railway track generally comes under the scope of a contractor who has a staff at his disposal experienced in this section of work. As the work draws near completion the engineers responsible for carrying it out prepare to hand their work over, and then the question of maintenance arises. Upkeep does not involve the employment of large numbers of men, or the use of great quantities of material; but it calls for careful organisation of an experienced staff (generally selected from men who have been employed during the construction), the proper location of stores, and the supply of requisite maintenance tools. In this the unexpected has always to be kept in mind, and such arrangements made that men, material, and tools can be readily found, and, what is more, brought quickly to any part of the line day or night. This is the principal object for which the system of organisation should be instituted. Accidents are not exactly in the regular programme of a railway company, but the importance of being in a position to deal with such eventualities is a duty to the public, and one which rightly receives first consideration.

The question of dividing the duties and defining to what extent they should reach is open to adjustment, and the fact that two sections of work are involved causes some little difficulty, while efficiency depends so much on the co-operation of the two. It is clear that an absolute understanding must be arrived at, so that the duties of the respective sections are made as far as practical, distinct, thus eliminating any possible confusion or indecision in emergencies. The work of general maintenance, alterations, operating switchgear to enable work to be done, bond and track cable testing, insulator replacements, handling breakdown gangs, and such like work involves overlapping between the electrical and track departments, and it often happens that the traffic section has interests in the proceedings. It is generally admitted that the electrical side should have control of their section. Linking up or operating section switchgear, and the electrical testing, should be in their hands, and no countermanding orders should be possible. Yet the needs of the track engineer or traffic section will often call for rapid isolation of lines, and in cases of such emergency it must be possible to operate without the delays attendant on consulting a second party. The exact line of demarcation is subject to agreement, but the leading points can be roughly stated. First the electrical side should have control of sub-stations and cables up to the distributing cabins. From this point they arrange the method of feeding, control the arrangement of sectioning switches, and decide the method of feeding the lines. The electrical department also have the upkeep and testing of LT cables up to the conductor rail. In addition, the testing of bonded joints, conductivity of rail, and insulation can be considered a part of the electrical work.

The permanent way engineer has to act under instructions from the electrical side in so far that a list of faulty joints is handed to him for rebonding. In the case of cable faults or extensions, he finds the labour and lays the cable, leaving the jointing to the electrical engineer. In the carrying out of general maintenance, such as replacing insulators, wood protection, and gauging rail, special tools are used, and it is possible to manage it without putting the conductor rail out

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of commission ; but when rebonding or making adjustment of ramps and joints, etc., it is necessary to isolate the section. In this case, to avoid interfering with traffic or trespassing on the electrical arrangements, the maintenance engineer applies to the signal cabin or section switch operator as to traffic conditions, and with the operator's sanction he gets the section switched off. He then puts his tab on the switches opened, the tab being kept in that position as an indication why and by whom it is opened. The maintenance engineer is responsible for the switches until he reclaims his tab, at which time he closes switches as he found them. Occasions arise where the switch is open on account of other work, and already has a tab affixed, but since he may also require it open, he adds his tab to the one already on, and thus for the time holds control of the line.

On most lines it is possible to disconnect short lengths by unbolting the bonds from the feeder terminals, and just bending the former (which are very flexible) back from the cable. This is very convenient and is often resorted to when the work has to be done some distance away from points of control. Of course in certain cases the time will have to be previously arranged, and telephone or signalling employed to expedite matters, but the system is the same, and the work is done without any delay or formality.

The equipment of tools necessary when working on a live rail may be detailed. A portable box of testing lamps (Fig. 1) at each distributing cabin is indispensable, as the operator has no indication whether a section is dead or alive, and one of the first rules on connecting or disconnecting is to make sure that the rail is dead or alive, as the case may be. Rails are often inter-connected and generally fed from both ends ; hence to cut a section out depends on the work of more than one person, and it is advisable to test before and after working. Each gang should be supplied with a box of lamps for the same reason. It will be noted that there are two sets of lamps provided, so that the failure of a lamp is of no serious consequence. When, as often happens, the distance between distributing points is of some length, a portable telephone, with leads and a long bamboo rod for reaching and tapping telephone wires, is of great assistance in procuring material or conveying instructions as to traffic conditions. The points on the box of lamps act as legs, and make a better contact than flat strips of metal.

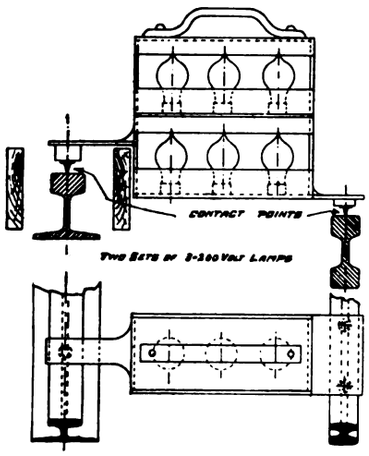

Fig. 1.—Portable Testing Lamps.

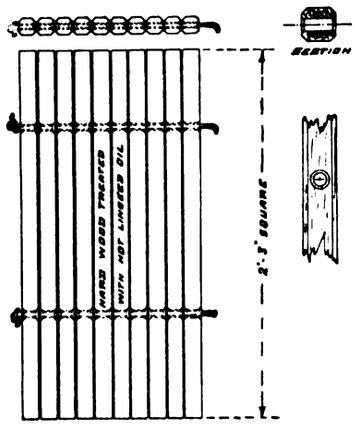

Fig. 2.—Wooden Mat.

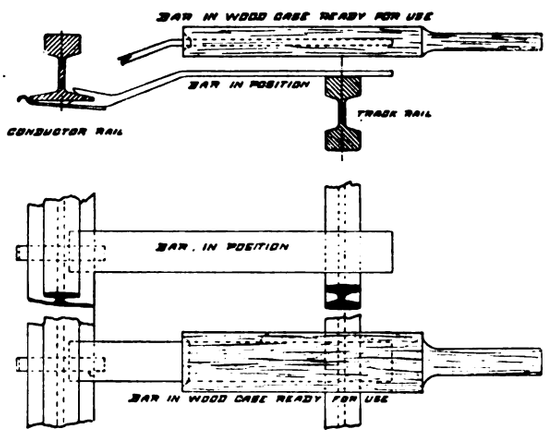

Fig. 3.—Shorting Bar in Wooden Case.

A wooden mat is made in the form shown (Fig. 2), so as to obtain flexibility, and take up the irregularities of the ground ; it has to be used on the ballast, and under those conditions is found to give a good foothold. The construction of the mat allows it to be coiled up into a small compass.

The shorting bar (Fig. 3) is only used in cases of emergency, but is essential where work is being done. It is usually considered to be part of the equipment of the signal cabin or distribution box, because an operator is always in charge, and is the first to learn of an accident within his locality. A gang working at a distance, if provided with a shorting bar, can quickly cause a disconnection in case of an accident. The shape of the bar is such that it can be quickly put between the live rail and track, and so blow circuit breakers ; it is kept in the wooden case ready for use. The case acts as an insulator whilst contact is being

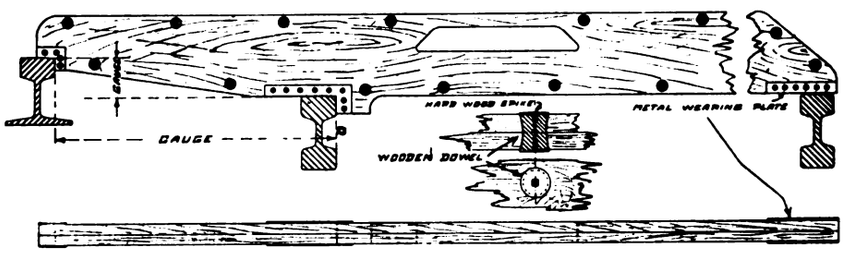

Fig. 4.—Insulated Conductor Gauge.

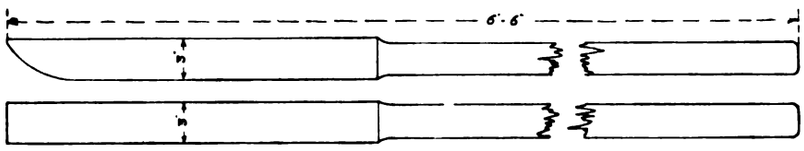

Fig. 6. - Wooden Lever.

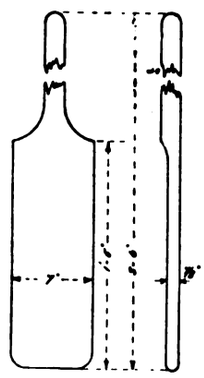

Fig. 5.—Wooden Spade.

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made, the bar dropping on to the track rail when the case is pulled away by the handle.

Next we have the insulated conductor gauge, which is serviceable for testing the position of the conductor rail whilst the current is on (Fig. 4). It is made in two pieces dowelled together with wooden pegs—there are no metal parts. With the exception of the gauge or wearing plates, the whole gauge is coated with varnish.

Wooden spade (Fig. 5) and wooden lever (Fig. 6) are two valuable tools made of hardwood treated with hot linseed oil; this treatment was found advisable, as it afforded good insulation in wet weather. In the case of spanners it was found best to coat the metal handles with varnish, and slide them into sleeves of wood with blank ends, thus protecting the ends of the handles. The wooden sleeves were kept on by the varnish drying, but to make quite sure small hardwood pins were put through the iron handle and wooden sleeve, and the whole taped over. In cases where damage occurs to LT underground cables, when delay might possibly arise in putting it right, an india-rubber jumper cable of about ·75 square inches is used, the ends soldered into G.M. clamps, which fit on the foot of the conductor rail, and are bolted up; the advantage of this is considerable when the time element is of importance. These lengths of jumper cable are used for alterations, temporary connections, or when work is left owing to bad weather, and are indispensable.

Location and distribution of stores for the supply of material and tools are naturally dependent on local conditions, but the position of the principal stores is not of so much importance in cases of emergency as the auxiliary supply depots. Supplies are usually required over a large area, and both material and tools must depend on local stores for a direct supply, and should not have to wait for deliveries from the principal centre. At each of the auxiliary depots a minimum supply of all requisites in both material and tools should be kept, and all withdrawals replaced from the main stores.

In choosing the position of an auxiliary stores it is advisable to have it near or in conjunction with the sub-stations, works, or offices, that may be adjacent to the line. For intermediate positions, the largest or busiest centres would naturally be selected. The means of telephonic communication is of importance, and should be installed if not otherwise readily accessible. Lengths of conductor rail are not easily carried, and often inconvenient to store, but to obviate trouble a good practice is to distribute equi-distant along the track small lots of rail, fishplates, and one or two spare ramps, thus providing an accessible supply at any point, and saving cartage. This method has been adopted and has been found very advantageous, the only precaution necessary being to have all the material painted and placed on timber or stones to prevent deterioration. At certain of the depots it is advisable to have a hand trolley for the rapid conveyance of men, tools, and material along the line, so that a gang is independent, and no delay is incurred waiting for trains. The necessary traffic signals, flags, and lamps should always be supplied, and the use of hand-propelled trolleys restricted so as to conform with traffic regulations. Under certain conditions a representative of the traffic section has to be in charge. On large systems, separate wagons could be kept provided with all essential gear and attached to the breakdown train. No hard and fast rule can be given, as conditions vary so much. Wood protection should be stored in complete standard lengths actually ready for use, and as such should be sent out from the works, so as to simplify the work of erection, and consequently reduce the time that would otherwise be taken in fitting pieces together on the site.

Besides the usual equipment of track implements, the insulated tools considered advisable to be kept in readiness at the auxiliary depots are insulated gauges, testing lamps, wood levers, wood shovels, insulated mats, shorting bars and cases, jumper cables with clamps, and a complete set of insulated spanners.

The amount of material to be retained at the auxiliary depots need only be sufficient to meet the average requirements for repairs on that section of the line. In the case of the main stores a standard could be fixed for sufficient material for the complete equipment of 1-50th of the total track electrified, but in the case of bonds and insulators, 1-30th of the total length of line will be necessary as the calls for these two items are heaviest, and it is advisable to keep a correspondingly large stock.

BELGIAN RAILWAY ELECTRIFICATION.

A Royal Commission has been appointed to examine the question of the electrification of Belgian Railways, and to submit proposals for the execution of the scheme. Before the armistice a Commission sat at Havre on the question of electrification of the railways. The *Board of Trade Journal* states that the work of this Commission was understood to be in an advanced stage last January, and a further conference was held towards the end of February to decide definitely whether or not any Belgian lines would be electrified.

The projected scheme is to electrify main trunk lines on the overhead trolley system. New carriages and motors would be supplied for the purpose, but trains would be so constructed as to be suitable for steam haulage over non-electrified lines. Carriages would be of the "coupé vento" bogie, metropolitan type, interconnecting, and would have two doors on either side. The object aimed at would be to use trains over scheduled distances, i e., trains would run backwards and forwards on such routes as Antwerp-Brussels, or Arlon-Ostend. Auxiliary lines might be electrified later. The idea is to use German railway material pending its replacement by new rolling stock.

A BILL TO RESTORE TRADE UNION CUSTOMS.

By the Munitions of War Act, 1915, the Ministry of Munitions was empowered to operate all engineering and other works under its control free from any restrictions which trade customs or rights imposed. According to the rules of the Amalgamated Society of Engineers, for example, only members of the society could be employed in the workshops. Other trade unions had similar rules, and workshop practices were regulated in numerous details, the ostensible object of all these restrictions being to conserve the interests of the workers normally engaged in the different industries affected. But while on the one hand the demands of the fighting forces had denuded the works of skilled men, on the other hand the needs of the army for supplies of munitions of all kinds, which only the engineering industries could supply, had enormously increased. In such circumstances, unskilled labour and women had to be called in, and everything that obstructed the most rapid production possible pushed aside. On the undertaking of Ministers that their rights and privileges would be restored after the war, the trades unions waived their claims, trade union rules were abrogated, and all restrictions upon output removed, women and girls being largely employed upon what had formerly been regarded as the work of skilled men.

On Tuesday, April 15, the Minister of Labour introduced into the House of Commons a Bill, entitled the "Restoration of Pre-War Practices Act, 1919," which is the fulfilment of the Ministerial pledge to the trade unions. The text of the Bill is short, but it seems to contain a good deal of material for prolonged controversy. The Bill mainly aims at providing that:—

(1) Owners of establishments wherein trade practices had been departed from during the war shall restore, or permit the restoration of such trade practices within a month of the date fixed by the Bill, and continue to maintain that condition for a year. (2) Into establishments employing workers to whom the trade practices apply, though formerly free from obligation to trade union rules, these practices will be introduced. (3) A majority of the employees shall decide whether or not the trade customs and practices shall be resumed (4) The owner of an establishment may object, and his objection is to be referred to a special tribunal (5) Refusal to comply with the provisions of the Bill involves a fine not exceeding £25 for each day or part of a day during which the offence continues

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AN AMERICAN VIEW OF GRADED ZONE FARES.

The native home of the tramway is in a rather confused state, and its guardians are looking for some way out of the trouble. Tramway managers in the United States are finding that the incomes of their undertakings do not balance expenditure, and as Wilkins Micawber testified from the depths of experience, that means misery. For a long time the cause of the trouble seemed difficult to locate. "Here," said the American tramway managers, in effect, "we have an ideal system for collecting cash; every passenger, no matter how short the distance he travels, must put down his nickel. No fuss, no trouble, no worry in collection—it is all so simple a child could collect the fares—and yet there is the deficit. What is wrong?"

In the days of their prosperity the tramway managers in New York, and beyond, had seen and smiled at the British method of charging and collecting fares. It had seemed to them much trouble for very little gain. Cent, two-cent, three-cent, four-cent, and so on tickets, with a conductor ranging through the car continually collecting coins and punching tickets, carrying a ticket bank as long as his forearm, struck our transatlantic friends as very nearly the acme of the ridiculous. They had escaped all that by the mere application of common sense at the start—charge the passenger five cents when he boards the car, and there is an end of it.

The success of British tramway undertakings, which carry enormous numbers of passengers at the equivalent of a two-cent fare, has latterly, however, begun to give them quite an air of respectability in the eyes of United States managers, and the zone system of charging fares shares in the enhanced repute. After all, for a thickly populated old country, zone fares were not altogether to be despised; but, of course, for a country like America the uniform charge was the more suitable. In that tolerant frame of mind, our Transatlantic friends arrived at 1914. Then a mysterious disease began to attack all grades and classes of tramway undertakings. Traffic increased, and receipts mounted up; but so also did expenditure, and while the increase in receipts slowed down, the additions to expenditure quickened pace. Indeed, it seemed as though things were working backwards, and that the more traffic there was on a system the worse were the financial results. Here was a mystery. At last it occurred to someone to ask if every passenger who paid a five-cent fare really defrayed the cost of his ride. Nobody knew; short-distance, middling-distance, and long-distance passengers were all lumped together, and the only thing that remained certain was that cars did not pay the expenses of their journeys. To avoid bankruptcy, some tramway undertakings have adopted the expedient of putting a limit to the five-cent journey, and making an additional charge for any distance beyond. Results have shown improvement, and therefore the question whether or not the zone fare system should be adopted in America has become a live topic over there.

The question whether graded zone fares or uniform all-over fares give the best financial results can only be settled satisfactorily by a reference to the actual operation and results of the two systems. America has had very little experience of zone fares. With a view to placing before its readers and the United States public the essential facts bearing on the latter method, the American *Electric Railway Journal* recently sent Mr. Walter Jackson to make exhaustive inquiries into the operation of the principal tramway systems of Great Britain, and to communicate the results of his investigations to the journal. Glasgow was Mr. Jackson's first objective, and in a series of three articles he has presented a clear picture and interesting study of the electric tramways and traffic conditions of that city, which American managers should find suggestive and helpful in the new conditions that they have to meet. The third article was published in the issue of March 29, and we are now able to review the series as a complete whole.

Preliminary, and apparently of primary importance from the transatlantic standpoint, is the question whether graded or zone fares tend to aggravate the evil of congestion in the more densely populated districts through which it runs. In a foreword contributed by Mr. James Dalrymple, general manager of Glasgow Corporation Tramways Department, he answers the question in the negative, arguing that congestion was a much worse evil before the advent of the tramways. Mr. Dalrymple points out that the tramways have tended to spread the population over a wider area, stimulated the desire to travel, and says that a noteworthy and unexpected effect of the introduction of halfpenny fares was the "filling up of the cars during the slack hours of the day." On the whole, Mr. Jackson inclines to the same view, but in a recent speech on the subject of halfpenny fares, Mr. Dalrymple indicates a change in his opinion, and admits that the halfpenny-fare passenger tends to crowd out the more effectively revenue-producing penny-fare passenger.

With the subject of congested areas and the relation of Glasgow housing problems to the tramway services, which Mr. Jackson ably describes, we are not at present concerned. It is when he deals with the short distance rider that we find his observations fresh and cognate to the subject under discussion. He says:—

> Practically all routes are double track, run through from one end of the system to the other, and are amply provided with cross-overs, both at the terminals and along the routes, to ensure the utmost flexibility of service. Because of the cultivation of the short rider, even in the outer districts, the turning back of non-tripper cars is not extensively employed except at or near the city limits, where there may be a sharp falling off in traffic. For instance, the Paisley-Uddingston line, which is 14½ miles long, has a two-minute service on the 4½-mile section between Tollcross and Ibrox; a six-minute service between Ibrox and Paisley, and an eight-minute service between Tollcross and Uddingston. In such instances, the only complaint comes from terminus riders who find that they cannot board through cars sometimes because the latter may be crowded with short-haul riders. The through rider is less inclined than Americans to board a short-line car and then get on a following through car at the city line, because this means a second fare instead of the presentation of a transfer ticket.

Up till about twenty years ago it was a widespread belief that the first-class passengers on railways were the chief contributors to revenue, though railway officials had long known that the case was exactly opposite. The Report of the Peel Commission in 1867 clearly showed that the backbone of railway passenger revenue was the third-class, but the superstitious reverence for the first-class survived till the last few years of the 19th century, when the condition of railway affairs became so critical that inquiry into all the facts became an absolute necessity. After that, the first-class passenger traffic was recognised as a costly form of advertising.

A similar process has taken place with regard to long-distance traffic on the tramways. In the early days the through passenger was considered most important by tramway authorities, but the essential quality of a tramway system is its adaptability to the needs of the short-distance traveller. Experience has shown that the latter is not only the largest factor, but also that he pays best for his ride. Mr. Jackson brings out the point clearly in his observation of the

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Glasgow tramways. The note occurs frequently in his discourse, but we quote only this typical passage :—

When the halfpenny a mile fare was established in December, 1911, there were many who expected the direst results. Instead, the traffic increased at such a rate that the revenue per car-mile showed a slight decrease only the first year or so. Thereafter it exceeded the former figures. The overwhelmingly large proportion of riders who travel a mile or less, and the heavy pick-up travel, are shown in diagrams in the official report for the year ended May 31, 1918.

It must be clear that the consequence of such travel as this will be reflected in the passengers per car-mile statistics, and it surely is. For the fiscal year ending May 31 last, the number of passengers per car-mile for the entire system was 16·41, with nearly 23 per car-mile on the Paisley Road and Alexandra Park line. The average passengers per car-mile for the week ending December 14, covering the entire Glasgow system, reached 20·33. American operators who check these figures against their own will wonder whether the zone system can be so complex as assumed if it is capable of handling such dense traffic.

Statistics alone do not tell the story. A few typical incidents may be given to bring out the short-ride habit among a people who have never had a reputation for wasting their money. Apparently car riding is considered cheaper than shoe leather. On a trip inbound from Scotstoun to Glasgow, between 11 and 11.30 a.m., the writer observed that a soldier and himself were the only males on the car. Even the crew were women. Many of the passengers were women with empty market baskets who actually rode half a mile or less. Here was little more than shopping travel. Evidently for every Glasgow man who goes to work someone is left at home to do the marketing; and under the Glasgow combination of short-ride fares and frequent service, the homekeeper rides quite as often as the wage earner.

On the trips taken in the industrial sections during the noon hours, a conspicuously large proportion of the riders were grime-covered workmen who were travelling to and from lunch as a matter of course. Later in the afternoon the travellers were women shoppers and school children. Again and again one was struck by the contrast between the empty sidewalks and loaded cars, which were running on a two to three minute headway.

Another serious problem which such a heavy traffic involves is the adjustment of seating accommodation to the number of passengers. According to the writer's observation, confirmed by charts compiled by the Glasgow officials, there is very little overcrowding on the cars, the seating accommodation being largely in excess of requirements on all routes, excepting for two short periods in each day. That is to say, the favourable financial results are not obtained by crowding the passengers in strap-hanging masses. Of course, from the point of view of tramway economics, a large excess of seating accommodation is wasteful, but the figures for density of traffic already given effectually dispose of that objection. Important factors in this relation are the spacing of the stopping places and the speed per hour of the cars.

Obviously, says Mr. Jackson, a street railway that wishes to relegate the walking habit among the lost arts must seek the happy medium between too many stops and too few. The peace-time standard averages 600 ft., or between eight and nine per mile, with some spacings as high as 900 ft to permit less than 600 ft. spacing of traffic-gathering points. To economise coal, 200 out of 1840 single stops were temporarily discontinued except on the extremely busy Paisley Road-Alexandra Park belt line, where short-ride traffic is so heavy that conductors sell 1,400 or more halfpenny tickets a day. The saving in coal has not been of any importance, partly because most of the stops eliminated were not frequently made at any time, and partly because the fluctuations in a large power plant are not materially affected by the elimination of a small percentage of stops. Most of the stops are near side.

In Glasgow there are no special speed restrictions for vehicles making less than 20 miles per hour. The schedule speed of the Glasgow tramway system as a whole is 8·18 miles per hour, which, in view of the dense traffic and low motoring, is not so much below American speeds as one might expect. In the outer sections, the cars make schedules up to 16 miles per hour, but in the crowded down-town streets it is hard to do better than four miles per hour. Hence, if part of the down-town travel could be diverted to parallel streets, the increase in schedule speed would make it unnecessary to consider special non-surface rapid transit. The high density of travel keeps the scheduled running times unchanged all day.

All this looks smooth and easy, but it is very probable that, at the back of the mind of the American reader, and perhaps some British readers too, there is a doubt as to whether the description exactly corresponds to the reality. Is there not, for instance, a large staff employed behind the scenes, labouring constantly with the complexities of the system which appears to run so easily in public? The *Electric Railway Journal's* investigator has all along been aware that such a question must arise, and has prepared to answer it. It is obvious that a conductor collecting fares at the rate of nearly 350 per hour, for a continuous stretch of five hours or more, has no time to fill up forms of any kind. Yet on each route there are eight denominations of tickets, each one of which has to be properly checked and accounted for. Though the method by which the apparent difficulty has been solved on British tramway systems is known to nearly everybody concerned in the work in this country, Mr. Jackson's description of it is worth quoting :—

Every conductor begins the day's work with packets of the serially numbered fare receipts applicable to his route. These receipts are obtained from the depot clerk. The tickets of each classification are made up in pads of 25 or 50, and bear an initialling identification in addition to the colours and numbers. As many as eight rates of fare (½d. to 4d.) are used at Glasgow, which corresponds to the number of sections in the conductor's ticket holder. . . . .

A record of the first number and letter identification of each classification issued is made on the conductor's waybill, which is issued in duplicate. Receipt for the tickets and their correctness in numbering and quantity is acknowledged by his initialling the waybill. During the day the conductor makes his returns to cash clerks *en route*, and not to the depot clerks. In making the return for either a half or round trip, as the case may be, he hands in the original of the waybill with his own record of the top numbers left on the pad of each classification.

It is the function of the cash clerk, and not of the conductor, to figure how many of each class of tickets have been sold, what the revenue per classification is, and what the last numbers of each kind of ticket are. In other words, the conductor makes a blind return by giving up all the money in his bag, exclusive of the 3s. 6d. with which he starts the day, leaving the cash clerk to note down the shorts or overs. On concluding his last trip at the depot, the conductor turns in his tickets, cash, and punch to the depot clerk. The latter simply counts the cash and leaves the checking of the ticket numbers to the receiving department. The receipt of this cash for individual conductors is entered in a cash receipt book, which goes to the receiving department daily. The transactions shown on the individual waybills are summarised on the "total" waybill, which represents a conductor's full day's work. This record, which is made up by the receiving department, shows not only the actual total discrepancy based on the difference between the tickets issued and the cash received, but also whether the punch registration itself is equivalent to the number of tickets issued.

So far as the cash discrepancies are concerned, 1½d. in a day, or 1s. in one week, is admissible. Discrepancies between the registration shown by the punch and the number of tickets issued generally are due to the failure to punch every ticket issued. A difference in excess of six means the counting of the punchings. This is a tedious job, since it is necessary to assort more than 1,000 punchings of different colours, a separate shade being used for each rate of fare. As soon as the shorts have been entered, the original waybills containing the notation of error are returned to the conductor's depot for his signed acknowledgment. On going back to the receiving department entry is made in the "shorts" ledger, and the waybills are filed for reference in case of dispute.

The labour involved in the auditing and checking of cash and tickets seems immense when stated in such detail, but the whole of the receiving department is fully staffed by 131 persons, mostly women and girls. There are, of course, ticket inspectors, and other such officials, to check abuses on the routes. As may be observed, however, the latitude allowed to persons of defective character is rather circumscribed. In reviewing the whole situation, Mr. Jackson concludes that the handling of fare receipts in Glasgow is a comparatively simple affair, especially as there are no transfer tickets to complicate the situation. With his concluding opinion, that the checking up of the fare receipts is far easier than the checking of the time limits and other features of the American transfer, everyone at all familiar with the difficulties of inspection and the abuses to which the latter gives rise, will emphatically agree.

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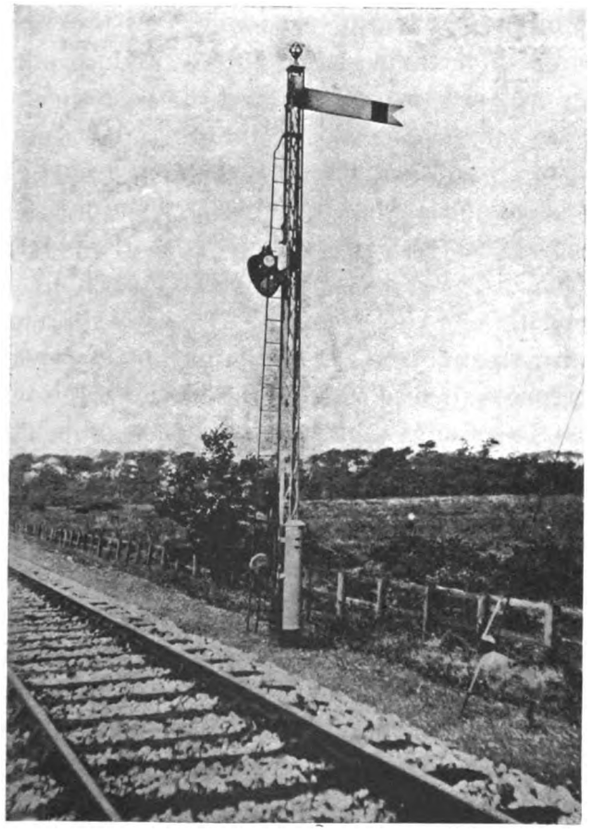
FLASHLIGHT DISTANT RAILWAY SIGNAL.

The speeding-up of railway traffic has greatly increased the importance of the distant signal. Formerly regarded as a mere precaution, the high standard showing on the railway track for miles ahead has become a necessity. In night operation especially the lamp of the distant signal gives the engine driver a much-needed assurance of a clear headway or a timely warning when the track is obstructed. Signal designers, however, have found it difficult to make a sufficiently strong differentiation between the lighting of the distant and the near signals, and to overcome the blanketing of fog. By their invention of the "Aga" flashlight distant signal for railways, Gas Accumulators, Limited, have offered a solution of the first problem and a very large gain upon the second.

The "Aga" flashlight signal is an adaptation of the company's system of marine signal lights which has



The "Aga" Flashlight as Distant Railway Signal.

been used for many years for lighthouses, lightships, and buoys in many parts of the world with success. The equipment is self-contained, and may be applied to any existing railway signal without interfering with the semaphore action. It comprises a cylinder containing dissolved acetylene gas, and a patent apparatus for displaying a light at frequent and fixed intervals. One cylinder provides illuminant for a known number of weeks or months, and the apparatus requires no attention of any kind during that period.

Because of its peculiar colour and intermittent action, the "Aga" flashlight enables the engine driver to recognise the distant signal at once, and at a greater distance than the ordinary lamp; the light penetrates fog and mist better than any other type, its penetrating power, as compared with oil or electric light, being five to one.

It should be clearly understood that the apparatus has long passed the experimental stage, having been in use for several years on the Furness Railway in this country, on several great American railway systems, and on a number of railways in Europe. Experience shows that the "Aga" saves much time in cleaning and changing lamps, and as the light is only burning at intervals instead of constantly, as in ordinary lamps, there is a considerable economy in the cost of illuminant.

CITY OF TORONTO MUNICIPALISES A STREET RAILWAY.

Provided the new agreement between the city of Toronto and the Toronto and York Radial Railway Company is approved by the City Council and ratified by the Provincial Legislature, the city will purchase the company's property and rights within the city limits. For two years the city has been discussing with the company the acquisition of that portion of its Metropolitan Division within the city limits. Arbitration proceedings were being carried out under an Act of Parliament which empowered the city to buy out the company in return for the retention of running rights by the company at a value to be determined by arbitration. The agreement, says the Canadian *Electrical News* of Toronto, will conclude the negotiations and render further proceedings by the Ontario Railway Board unnecessary.

The line of the Toronto and York Radial Railway Company which the city proposes to take over, runs between Farnham Avenue and Yonge Street, a distance of about 3.5 miles. The substance of the agreement is that the city purchase all rights, franchises and privileges owned or exercised by the company within the city limits, together with overhead and ground equipment, rails, etc., eight standard cars and all other property of the company within the city for £118,000.

As soon as the agreement becomes effective, the company is to cease the operation of its cars over that portion of Yonge Street within the present city limits and will establish a terminal station near the northerly city limit. If the physical conformation of the land on the west side of Yonge Street immediately outside the limits of the city renders it impracticable to establish a terminal station at that point, the company may erect such a station on a site within the city limits and may operate its cars between the city limits and such terminal station on tracks which are to be constructed and maintained, with the necessary structures and overhead line, by the city. For the use of these the company is to pay an annual rental of 7 per cent. per annum upon the cost of such construction.

The company retains the right to establish receiving and forwarding stations within the limits of the city, all such receiving, forwarding and terminal stations not to be situated on streets or squares or public places, and the transfer of any package, freight, or express goods is not to be made on streets or public places.

Until the city acquires the street railway now operated by the Toronto Street Railway Company the city is to provide cars to carry packages, freight and express goods of the company to and fro between the new Yonge Street terminal and the terminal to be provided by the company near Farnham Avenue.

After the street railway is acquired by the city, it is, if the company desires, to construct and maintain on the public streets of the city, the tracks and necessary structures and equipment required to give access for cars to the receiving, forwarding and terminal stations, and the company is to pay to the city the entire cost of the construction.

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THE EDITOR will be glad to consider articles by experts. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, MAY 15, 1919.

The Economics of Transport.

The organisation of the transport services of the nation is in the melting pot. Not only have we a Ways and Communications Bill which is designed to establish a Ministry that will control and direct public utilities hitherto managed independently by companies and local authorities; but necessity seems to demand Government supervision of the practical details of tramway, omnibus and other transport operations. Until recently, for instance, tramway and omnibus fare charges were regarded as matters which could be left to the adjustment of the parties immediately concerned—that is, the public using the service and the providers of it—within the limit of the Parliamentary "penny a mile" rule. Costs of materials and labour have risen, and omnibus companies and local authorities have thought it only just that the increased costs should be met by increased fares. Such a solution of the economic problem seems at once simple, just, and easy. Unfortunately the solution is too easy, and offers a temptation which controllers of undertakings are not always able to resist, and public policy demands that efforts be made to find other ways of getting over the difficulty. A tramway or an omnibus service may have become a necessity to the industrial life of a district, and the raising of fares may place upon an industry vital to the nation a dangerously heavy burden. Numerous enquiries are therefore started. The public asks all sorts of questions for which answers have not been formulated. Is it right, for instance, that a tramway undertaking should be burdened with the upkeep of the streets and roads on which its track runs? Or, are the dividends of a given omnibus company paid upon actual capital? Or, is the economic pressure upon certain undertakings directed to produce efficiency? These are only a few of the numerous queries now being raised in the public mind. Answers, and satisfactory answers, must be forthcoming, if worse trouble is to be averted. Then, as Sir William Bull has recently pointed out, facilities for travel have fallen far behind the necessities of the public. Provision of such facilities cannot be left to the hazard of private enterprise. Quite rightly, the private capitalist must be assured that such or such a project to which he is asked to subscribe will yield a fair return on the capital expended. But the public interest may demand that the service should be instituted, even though it may entail risk of loss in working for years. It will profit the nation as a whole greatly, and really result in great gain indirectly. Therefore, the duty of instituting such services must be laid on the nation, and the capital necessary should be provided from the public exchequer. At present, it is possible only to touch these few general aspects of the vast problem pressing for solution. The difficulties contained and the interest involved are so weighty as to call for earnest consideration and the greatest goodwill on every hand.

The Business Parliament.

The political complexion of the present Parliament may be admirable or the reverse, according to the standpoint of the observer, but it is safe to say that never before were the interests of industry, commerce, and labour so predominant in the House of Commons. Many worthy people look back with regret to the time when Members

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of Parliament represented purely political ideas, but whether we like it or not, we have to recognise the fact that the day of government by political party is over. So long as Parliament had to deal only with broad questions of national policy at home and abroad, the University man with his wide outlook, the lawyer with his trained intellect, and the politician skilled in the art of adjusting means to ends, served well enough; but during the past 40 years Government has been brought more and more into touch with the business details of the national life, and instances might be given of the sad mess politicians made when called upon to deal with practical business affairs. Recrimination, however, is a profitless mode of argument. Whatever may be said of the past, there is no disguising the fact that Government is now at close grips with the industrial, financial, social, and commercial affairs of the nation. Industry is not merely the business of the individual manufacturer, but the concern of the whole people; commerce is not a matter which may be safely left to the "higgling of the market," and the enterprise of shippers; the remuneration of labour has ceased to be merely a matter of bargain between employers and workers. By the solution of the problems facing us in each and all of those departments, the nation will stand or fall, prosper or suffer. It is therefore inevitable, and good on the whole, that business men and labour representatives should predominate in the House of Commons. The conduct of the Standing Committee on the Ways and Communications Bill, during the sittings which concluded with the adjournment for Easter, affords a good example of the legislative methods we may expect in the near future. It may be said that the debates have been largely a conflict of interests, but anyone who cares to read the reports of the Committee will see something more than that. Here are men with expert personal knowledge of the subjects under consideration, stating their views and giving judgments. If they are trying to conserve a financial interest against the requirements of the nation, they give data and bring forward actual practical difficulties. The Committee is not bound to give effect to the desires inspiring the opponents of the Bill, but it benefits enormously by the knowledge they bring forth. In no case has a purely sectional interest dictated amendment of the Bill, but in some cases unintentional injustice has been avoided, and the efficiency of the measure has been largely enhanced. A Bill of such far-reaching scope, trenching upon so many interests, was bound to contain imperfections and provoke legitimate opposition in its first draft, and it is all to the good that it has been subjected to the keen scrutiny of those whose interests are most vitally affected. Legislation which creates grievances is bound to fail in the long run. Criticism of the Bill in Committee has strengthened it in two ways. On the one hand, the Government has made amendments which meet real objections and removed the possible causes of grievance, and on the other hand it has been shown that the main provisions of the Bill are sound and impervious to the attacks of loud-voiced agitation and the fallacies of pretentious authority.

Renewals and Repairs.

By this time there are very few undertakings whose management can contemplate further postponement of track reconstruction and repairs. The long period over which it has been impossible to obtain sufficient materials for the relaying of tracks has rendered imperative the carrying out of works more permanent than the scanty repairs effected during the past three years. This reason presumably accounts for the demand for manganese steel rails, points, tires, wheels, axles, and other railway and tramway steel, which is growing more insistent daily. It is further reported that the high steel prices have not, so far, hindered what is referred to as a fair development of the home markets. The leading steel firms, it is further asserted, appear to have plenty of good inquiries and even good order books. This may be regarded as a certainty, for the need is imperative, and, as before indicated, permits of no delay if safety of passengers is to be assured and damage to rolling stock prevented. When such contingencies have to be faced high prices cannot be regarded as justification for delay in the placing of orders. If any further argument be needed to persuade managers to action it is to be found in the statement that the iron and steel makers look for an inevitable further rise in the prices as

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soon as the subsidies are removed at the end of the present month. The most important consideration to be adduced in favour of this anticipation is that, with the removal of the subsidies granted to encourage the home production of pig iron when the submarine menace was growing, there may be a shortage of raw material. Yet it is difficult to understand why that effect should come about, provided the material is of as good a quality as that which can be imported. Pig iron imports are already being made by the Clyde from the United States, which is an indication that shipping is being liberated for commercial purposes. Further, it is said that manufacturers are threatening to import American basic billets. Doubtless there will be advocates for a continuance of the subsidies, but with the increasing liberation of tonnage such an aid to home production will be rendered futile unless a duty is placed upon the imports of raw materials, to say nothing of manufactured goods. Apart from the question of quality, there is the consideration of whether our stock of pig iron is extensive enough to meet demands, and also whether the nation would not gain more by conserving it for use in any future crisis. In the past the ease with which this country has obtained its imports of the raw materials for the iron and steel trades has enabled manufacturers to compete with the world. It would therefore appear to be the wisest policy to turn attention to one other influence which is stated to be "obscuring the outlook and causing anxiety regarding overseas trade." The other influence arises from the demands of labour. As a large volume of inquiries is already coming to this country from abroad, the need for a prompt settlement with labour is increased. These overseas inquiries convey a moral to British traction undertakings, apart from the need to provide work for labour displaced by the cessation of the war.

Home Office Traffic Powers.

A statement made in connection with the Ways and Communications Bill would appear to reveal a hitherto undisclosed reason for the failure to secure a Traffic Board for London. It had been supposed that the Government declined to settle the question on account of the contention of one section of the County Council that that body should hold the predominating position. A more likely reason is, however, that permanent officialdom installed in the Home Office refused to part with their control of traffic powers, other than those relating to through running to localities outside of their area. The responsibility for the decision has been put upon the Home Secretary as chief of the department. It is a matter of surprise that Mr. Shortt has consented to such a course in view of the unrelenting manner in which he has spoken for the Government in their resistance to proposals to lessen the powers of the new Ministry over any of the forms of transport included in the Bill. This out-of-date attitude of the Home Office will perpetuate the system of divided control of the traffic of the metropolis. Furthermore, if the Government do not insist upon ruling departmental officials in as stern and commonsense a manner as they have shown in other interests, they will be taking a step not only against the best interests of the metropolis, but one that will bring discredit on Royal Commissions and Select Committees. The unification of control was urged by the Royal Commission on London Traffic which sat in 1905 and by the Select Committee on Motor Traffic and Power-driven Vehicles which deliberated so short a time ago as the year before the war. The latter body urged "that in all metropolitan traffic matters Parliament should be advised by one department, which should combine the traffic duties of the Home Office, Local Government Board, and Board of Trade, including the confirming of by-laws." As Mr. H. H. Gordon has pointed out, the maintenance of the reported decision of the Home Secretary will cause a considerable amount of dual control and overlapping. Traffic by-laws made by local authorities for the purpose of "good rule and government" will require the sanction of the Home Office; other traffic by-laws such as speed limits, or the working of tramways, the sanction of the new Ministry. Constructional details of certain stage carriages will need the sanction of both. All motor drivers will be registered by the County Council, and drivers of hackney carriages by the Home Office, for whom the police act. There is wisdom also in Mr. Gordon's contention that the police should be concerned only with seeing traffic regulations carried out

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and should not continue their present limited task of prescribing the regulations. Than Mr. Gordon there is no public man in London who has made so extensive a study of traffic conditions in Europe, and he asserts that he has been deeply impressed with the superiority of London as regards co-operation and confidence between drivers and the controlling authority. He attributes the less desirable state of affairs on the Continent to the police being both the legislative and executive authority for traffic. The outlook of all forms of London traffic for obtaining fair treatment under the new Ministry is so good that the Home Office should not be permitted to perpetuate the conflict of interests that have hampered the more enlightened rule of the Board of Trade.

LONDON TRAFFIC CONGESTION.

SELECT COMMITTEE DEMANDED.

London Members of Parliament met in one of the committee-rooms of the House of Commons on Monday, May 5, to consider the question of traffic difficulties in the metropolis. Sir Harry Samuel presided over a large attendance. Mr. Frank Pick, commercial manager of the Underground Electric Railways Company, was present, and gave much interesting information relating to the working of the underground railways and the London General Omnibus Company.

Mr. Pick explained how the present congestion has arisen. At the outbreak of war, he said, the London General Omnibus Company, and companies with which it was associated, worked on an average 2,750 motor omnibuses in the streets of London. But as the result of an arrangement with the War Office, 1,319 of those vehicles were withdrawn from traffic and sent to France. The company thereupon took steps to restore the position on the streets as far as possible. The result was that in 1915 the number of omnibuses working daily on the streets was 1,928, and in 1916 it was 2,001. The next important factor was the rationing of petrol, and in 1917 that brought down the fleet of omnibuses in operation to 1,796. To-day the company were working on an average 2,062 omnibuses—an increase of 15 per cent. since the conclusion of the armistice. They were building up from spare parts which they had secured about 250 additional vehicles, and the War Office was returning omnibuses, a few of which the police authorities might pass as fit for service on the streets. They hoped by these means to provide a working fleet of 2,300 omnibuses. In 1917 the Commissioner of Police issued a notice to the effect that new motor omnibuses for London would have to comply with new standards both of design and construction. Experiments have been conducted with a view to supplying a type of omnibus which will comply with the more stringent regulations. The omnibus is not yet completely ready, and even if the police accept it a considerable time will be required to construct any number.

Asked to explain the reason of the recent increase of fares on the omnibuses, Mr. Pick said that it was to meet the increased cost of working. Working costs had risen by the following percentages:—

1914	4 per cent.	1917	64 per cent.
1915	22 ,,	1918	98 ,,
1916	32 ,,	1919 (3 mos.)	130 ,,

With regard to the last figure, 48 per cent. of the increase was due to wages and 48 per cent. to materials and petrol. Mr. Pick proceeded to say that he could give the profits for the whole combine for a series of years, but not for the omnibuses separately. After paying debenture interest and preference dividend the following sums of money were available for distribution on ordinary stocks in each year:—

1913	£409,271	1916	£462,868
1914	428,963	1917	476,237
1915	407,265	1918	558,191

Continuing, Mr. Pick stated that during 1915 and 1916 the congestion of traffic on the omnibuses was sufficient without an increase of fares to pay the increased costs. In 1917, when the expenses commenced to increase at a much more rapid rate, they soon discovered that their net earnings per omnibus mile were falling, and it was in that year they first began to increase fares. As the result of that increase the net earnings per omnibus mile in 1918 were exactly the same as in 1913. In the first three months of 1919 they had not earned any profit whatever on omnibus traffic in London.

Then the institution of the eight hours day meant that they needed 700 more skilled men to maintain their fleet of cars at its present level of efficiency, and the expenditure of an additional £24,000 on plant and tools. The real trouble on the Tubes arose from the fact that they had to absorb the passengers which the omnibuses could not carry, and the Tubes had carried 69 per cent. more passengers. They had not been able to buy a single car for running on the Tubes since the outbreak of war, and would not be able to do so until the end of this year. If a car had a really bad breakdown the labour and materials at their disposal during the war were insufficient to enable them to repair it. Consequently their fleet of cars in operation had been reduced from 544 to 504, and they were only now in a position to start overhauling the 40 cars which were not working.

In reply to a question as to the cost of a tube railway per mile, Mr. Pick said it cost about £1,000,000 per mile fully equipped. Answering Sir Samuel Scott, Mr. Pick said the reserve of the London General Omnibus Company dated back to 1912. They put aside £175,000 a year for the purpose of renewing their omnibuses. The reserve fund now amounted to £1,904,000, which, at £1,000 per omnibus, represented only 1,900 new vehicles. There was not enough money in the reserve fund to-day to replace the existing fleet of omnibuses. Was it unreasonable that a passenger should pay one-eighth of a penny towards the reserve fund for upkeep and renewals?

In reply to Sir H. G. Norris, Mr. Pick stated that the congestion of traffic on the Tubes had enabled them to postpone advancing fares. They got the money by crowding people in. There came a time, however, when the congestion of traffic was not sufficient to meet the increased cost, and then higher fares were essential.

The question was asked seeing that in 1918 they made £80,000 more profit, can you give us the reason for raising fares?

Mr. Pick replied:—When you increase fares you cannot foretell the exact result. You budget for a certain amount. Sometimes you get more and sometimes less. In times of war you have to be conservative in your estimates. That figure represents 1¼ per cent. more traffic receipts from the public, so that it is quite a trivial excess. We have not aimed at making profits by increasing fares, but at balancing our earnings and expenditure. If we have overestimated it has been an ordinary commercial mistake. The position of our companies is not worse as a result of the war, but no one can say the position is good. The average earnings of all our companies is 3·64 per cent.

Mr. Pick, continuing, said that their companies afforded more facilities than any other undertaking in the kingdom, many of them at a loss. They had pioneered all kinds of developments. It was their policy still to give the best service they could at the lowest rate of charge. The moment they were in a position to give increased facilities and cheaper fares they would do it. They were of opinion that when the war period was over things would react and their expenses would not be so high. They were going to try to give everybody a seat again at a reasonable price, and they were now applying to Parliament for authority to raise £2,500,000 in order to improve London's traffic facilities. They were taking steps to enlarge the tunnels of the City and South London Railway so as to increase the size of the cars to the standard of other Tubes. The passengers carried by the companies he represented were as follows:—

1913	836,000,000	1916	818,000,000
1914	809,000,000	1917	832,000,000
1915	769,000,000	1918	901,000,000

The chairman having thanked Mr. Pick for the information he had afforded, Lieut.-Colonel Sir M. Archer-Shee moved the following resolution:—

> That this committee of London members strongly urge the Government to set up a Select Committee to consider the question of London traffic, and report what steps are necessary to relieve the present state of congestion.

Sir Samuel Scott seconded, and the motion was agreed to.

On the motion of Mr. Kennedy Jones, it was decided to appoint a deputation to interview the President of the Board of Trade and the President of the Local Government Board with the object of urging that immediate steps should be taken regarding the traffic difficulties. The following were selected as members of the deputation:—Sir Harry Samuel, Sir W. Bull, Mr. J. D. Gilbert, Sir A. Yeo, Mr. Kennedy Jones, Mr. C. F. Higham, Lieut.-Colonel Sir M. Archer-Shee, and Mr. Clem Edwards.

Fares Increased at Liverpool.—The Tramways Committee have decided to increase the fares on the basis of 1d. for 1·5 miles, with a proportionate increase for longer stages. One member of the committee proposed an amendment that no increase should be made until 50 per cent. of the reserve, now amounting to £406,280, was exhausted, but the amendment was defeated. It is stated that this increase in fares will mean additional revenue of about £140,000.

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RECONSTRUCTION IN FRANCE.

PLANS OF THE HIGH COUNCIL OF THE PUBLIC WORKS DEPARTMENT.

The Higher Council of Public Works was set up by a decree of the French Chambers of September 9, 1917. It includes, among other members, the general inspectors and directors of the central administration, which forms the General Council of "Ponts et Chaussées," Members of Parliament, the Council of State, and high officials of other Ministerial departments, as well as qualified representatives of commerce and industry attached to the Department of Public Works. The introduction of technical and business men into the Council has given the best results. Interesting innovations have been made in the procedure of business submitted to the Council, which when occasion arises consults Chambers of Commerce, representatives of industrial or commercial firms, and promoters of new enterprises. The Council is empowered to proceed at once to make investigations. Finally it is authorised to take the initiative in regard to all proposals relating to the improvement and the administration of ways and communications, as well as the creation, management, and distribution of motive power.

The Higher Council of Public Works consists of the full assembly, to which is reserved the examination of questions of a general character and affairs of particular importance under four sections (the planning and distribution of electrical energy, navigation, and utilisation of water power, maritime ports, and railways). The business of the railway section is brought before two or more sections sitting together when it relates to more than one class.

By a further decree of November 18, 1918, a Commission of Investigation was instituted, whose function it is to examine general questions, and to collate French and foreign publications relating to public works.

We give below a translation of a summary published in the *Revue Générale de l'Electricité* of a report prepared by the Higher Council for the Ministry of Public Works and Transport, and presented to the President of the Republic. The report was published in full in the *Journal Officiel* of February 3, 1919.

Matters Dealt with by the General Assembly.

We cite here only some of the business submitted to the full assembly since the constitution of the Higher Council. The Council has considered a proposed law dealing with the means for constructing and improving navigable waterways and ports. This project, as amended by the Council, has now been submitted for approval by the ministers interested. This is also true of a Bill for amending the Act of January 15, 1912, dealing with the management of ports. The Council has also taken the opportunity to make a temporary increase of 25 per cent. in the rates charged by the main railways. The project drawn up by the Government for permanently maintaining public works carried out during the war has been submitted to the Higher Council. The text prepared as a result of these deliberations has been favourably reported upon by the Commission of Public Works to the Chamber of Deputies. Beside these different projects the Council has had to examine a number of questions of considerable importance.

The Improvement of Communications between Switzerland and the Ocean Ports.—After a comprehensive investigation, in the course of which numerous interested parties were examined, the Council proposed the following programme:—As far as concerns the maritime ports, the execution as rapidly as possible of works acquired for the ports of La Gironde and La Rochelle-Pallice, and the continuation of an investigation upon the port of Saint Nazaire.

Concerning railways, the establishment of a new line, with easy gradients between Limoges and Saint Germain-des-Fosses, and as a first step the improvement of the actual running time of the expresses from Bordeaux to Lyons by means of the electrification of certain main lines, the strengthening and doubling of tracks, and the removal of zig-zags.

Reconstruction and Standardisation of Permanent Way.—The Higher Council has presented proposals, to which present circumstances lend special interest, relating to the standardising of material (rails, crossings, etc.) for railways, and the estimate of their requirements for the periods from 1919-1923, and 1923-1933. The principal object of these proposals is to provide information for the metallurgical industry upon the extent of the orders they will have to deal with.

Reconstruction and Standardisation of Rolling Stock.—Similar work has been done in standardising types and estimating orders for locomotives, carriages, and wagons. The Council in this connection urges the desirability of the opening by the principal railway companies of a common office or clearing house for research and the placing of orders. The object of these measures is to secure the standardisation of types of rolling stock and to improve organisation and manufacture throughout French industry, which for a long time has had reason for complaint under these heads.

Matters Dealt with by the Sections.

In view of the number of questions examined by each section, only the most important can be cited here:—Schemes for the extension of the ports of Dunkirk, Caen, Bône, Porte-de-Bouc, and Algiers, projects for the improvement of the old port at Marseilles, the establishment of quays at Mâcon and Châlon-sur-Saône to be served by the Paris, Lyons, and Mediterranean Railway; the project for the construction of a maritime station to be named Mirabeau at the port of Marseilles; projects for the alteration of bridges at Alma, Tournelle, and of Corbeil sur la Seine for the improvement of navigation.

The second section of the Council has considered eight proposals for the use of waterfalls of the Garonne, the Ain, and the Durance, powers varying from 2,000 to 32,000 H.P., giving a total of 150,000 H.P., which corresponds to an annual consumption of 750,000 tons of coal.

Work of the Committees of Investigations.

At present there are thirty-three Committees of Investigation, their function being to examine schemes for public works designed to improve the economic condition of the country. They examine schemes both from a technical and economic point of view, and draw up working plans for carrying out projects, and prepare estimates which will permit the practical carrying out of the work from available resources. They endeavour to avoid heavy interest charges during construction by assuring the use of the new facilities with the least delay. We may now glance rapidly at the work that has been done by these committees.

Routes.—This Committee has for its object the investigation of measures for the reconstruction of roads, the employment of special surfaces for certain specified roads, the organisation of services for maintenance, and the employment of new methods for such maintenance, the marking out of routes for tourists, the revision of the classification of roads and paths. The Committee has concerned itself with the repair of roads damaged or not maintained throughout the war, and has prepared the first project, including the supply and delivery of more than six million cubic metres of broken stone and of 2,800,000 square metres of paving for immediate use. The expense, which will be borne by the Treasury, is estimated at 275,000,000 francs, and will be spread over two years.

Improvement of Waterways.—The Committee deal with the following questions:—Extension of wharves, increase in the dimensions of basins, locks and bridges, improvement of dams, reservoirs, methods of haulage, railway connections and loading facilities, an organisation to deal with maintenance and repairs, particularly with a view to minimising periods of interrupted operation.

Canals and Navigable Streams in the North and North-East.—This Committee has been occupied principally with the study of the Nord Canal, which was under construction before the war. It had been designed for canal barges, but was partially destroyed in the course of hostilities. The Committee estimates that in its reconstruction it will be necessary to provide for boats of 600 tons, and has studied the enlargement of the channel and the construction of locks of a new type. The same Committee proposes soon to deliberate upon the extension of the Ardennes Canal to a junction with that of the Marne-Rhine.

Improvement of the Seine between Montereau and the Sea.—This Committee has considered a project including the deepening of the Seine to 4·5 metres between Bougival and Rouen, and it has formulated a scheme in which are indicated the works that can be immediately undertaken.

The Loire from Nantes to Briare.—This Committee, quite recently formed, is dealing with the most suitable means for rendering the Loire navigable. It will issue its report shortly.

Other committees are charged with the following inquiries:—The canals of the Garonne, Loire, Berri, Moulins-Sancoins, Loire to the Rhone, and the navigable waterways of the Sud-Ouest.

Utilisation of the Rhone from the Point of View of Navigation, Motive Power, and Agriculture.—This Committee has been actively studying the use of hydraulic power of the Rhone in its higher reaches, and the communications with Switzerland by way of the Rhone. It has investigated also the construction of a port at Lyons and the hydro-electric power obtainable from the Rhone at Lyons, the question of the irrigation of the valley of the Rhone, and a vast project including the management of the whole river. As far as concerns the use of the motive force of the Upper Rhone, the Committee is now having soundings taken to decide where the great dams projected are to be located, whether at Genissiat, or Malpertuis and Bellegarde.

Rhone-Rhine Canal.—The return of Alsace to France renders urgent the improvement of this canal. The Committee is investigating a project which will allow the passage of the big steamers of the Rhine and the Rhone.

Water Power.—A Committee for this purpose, particularly important for the economic future of the country, is investigating the possibility of the use of water power over a very extended area. With this object it is drawing up a list of the principal available waterfalls, investigating the means of making them serviceable, and of utilising them in the best interests of industry and agriculture. In order to facilitate its work the Committee is sub-divided into four sub-committees, dealing respectively with the utilisation of water power in the four great regions, the Alps, the Pyrenees, Centre, and East.

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Distribution of Electric Energy.—This Committee, whose function it is to investigate means for utilising electric energy, has undertaken an inquiry among the principal companies concerned in the distribution of electricity to ascertain their requirements, which will serve as a basis for any necessary improvement of present legislation. The Committee is also drawing up a general map of the existing system of distribution, especially the high tension lines. Upon this map existing omissions will be evident, and the best means that can be employed for dealing with them. The work that the Committee propose to carry out will include a map of new lines to be constructed, their situation, and classification in order of urgency.

Maritime Ports of Havre, Rouen, and the Seine.—This Committee has recognised the necessity of establishing a new railway between Rouen and Havre to serve the maritime establishments in the Lower Seine, and the ports of Rouen and Havre. On the other hand, it has considered the installation of a ferry across the Seine in the vicinity of Quilleboeuf in order to obtain communication between the port of Havre and the south-west. This solution has been dealt with only provisionally, for the final means of transit will be a tunnel under the bed of the Seine. The State Railways had suggested a crossing above the estuary of the Seine. The Committee has proposed and is investigating a tunnel under the estuary itself between Havre and Honfleur. This Committee is also occupied with measures for improving the ports of Rouen and Havre.

Port of Caen.—This Committee has drawn up a general programme including the development of the quays and railways, the deepening of the canal which connects the port with the sea, and the improvement of the inner and outer approaches to Ouistreham, whose lock and jetties are to be reconstructed.

Fishing Ports.—This Committee has considered the construction of four great fishing ports, with a view to making the maritime industry an important element in the national food supply. These ports are Boulogne, Lorient, La Rochelle, and Cette on the Mediterranean. The Committee will also deal with the transport of fish by railways.

The Maritime Establishments of Saint Nazaire, Nantes, and Basse-Loire.—This Committee is investigating the improvement of these two ports and of the Basse-Loire. It thinks that the traffic arising from this source might amount to twelve million tons.

Finally, a Committee is concerned with the deep sea ports, which should be able to accommodate at any hour the largest present steamships or those that are likely to be constructed in the future.

Railways.—Different Committees are occupied with important questions relating to railways, such as the improvement of railway connections between Switzerland and the ocean ports, the tunnel under the Channel, the question of material available, etc. A special committee is dealing with the questions of permanent way and rolling stock belonging to light railways.

Electrification of Trunk Lines.—At its first meeting the Committee adopted a programme of works, and appointed two sub-committees, one administrative and the other technical. The administrative sub-committee has examined proposals for the electrification of three systems, viz., the Midi, the Paris-Orleans, and the Paris, Lyons, and Mediterranean Railways. These proposals cover a total of 8,200 kilometres of line, and include expenditure on hydro-electric stations, transformer, and feeder stations, and locomotives, of an estimated value of 2,400,000,000 francs. The technical sub-committee has drawn up a comprehensive report setting out the actual experience gained in France and abroad in the electrification of heavy railways. This report will serve as the basis for a discussion after a thorough demonstration carried out by such means as the committee consider suitable, and should lead to a determination of the best mode of electric traction for the French railways.

Other committees have considered the conversion of certain light railways into standard lines, and the work this will entail. Extensions of the present railway system are also incourse of investigation. A general section is preparing reports upon the use by France of the Port of Antwerp, international transit, the control of fares, and the means of transport dues to be levied on the ports and for the use of quays, the correlation of water and rail transport.

Such is in brief an analysis of the principal questions investigated by the Higher Council of Public Works. The programmes drawn up are magnificent. They seem too grand. Even with the best will of the Ministry of Public Works, is it possible they can be executed? Will not politics upset these programmes, which would give France an enormous development? Let us hope that the future will prove the contrary.

ELECTRIFICATION OF BELGIAN RAILWAYS.

According to the Belgian press, experiments in the electrification of railways (referred to on page 248 of this issue), are to be conducted on the line between Antwerp and Brussels. The execution of the necessary works will be offered for tender to the principal Belgian and Allied manufacturers.

LONDON COUNTY COUNCIL BILL IN PARLIAMENT.

POWERS SOUGHT FOR TRAMWAY EXTENSIONS AND MOTOR OMNIBUS SERVICES.

The London County Council has decided to apply to Parliament for authority to construct additions to their tramway system, and to seek powers to own omnibuses and run omnibus services. A Bill giving effect to these proposals having been presented to Parliament, with an explanation of the reasons why deposit of the Bill has been delayed beyond the statutory period, the House of Commons has agreed to the suspension of the Standing Orders so that the Bill may be proceeded with in the present session. The main provisions of the Bill are as follows:—

PROPOSALS FOR THE CONSTRUCTION OF NEW TRAMWAYS.

(1) Double line, 5 furlongs 0·45 chains in length, from the existing tramway in Farringdon Road to Blackfriars Bridge *via* Farringdon Road, Farringdon Street, Ludgate Circus, and New Bridge Street.

(1a) Double line, 5·9 chains in length, from New Bridge Street by a junction with tramway No. 1 to Victoria Embankment by a junction with the existing tramway at a point 2½ chains eastward of junction of John Carpenter Street with Victoria Embankment.

(2) Double line, 2 furlongs 6·1 chains in length, from the existing tramway in Gray's Inn Road *via* High Holborn, Holborn Circus, and Charterhouse Street to Farringdon Road, terminating at a junction with tramway No. 1.

(2a) Double line, 2·04 chains in length, from a junction with tramway No. 2 at a point 1½ chains westward of the junction of Farringdon Road with Charterhouse Street to a junction with tramway No. 1 at a point 1½ chains southward of the junction of Charterhouse Street with Farringdon Street.

(3) 7·55 chains of double line, and 1·1 chains of single line, from Aldgate High Street at a point 1 chain eastward of the junction of Minories with Aldgate High Street to Whitechapel High Street, terminating at the existing tramway.

(4) Double line, 5 furlongs 3·4 chains in length, from the existing tramway in Hampstead Road *via* Tottenham Court Road to a point 1 chain north-westward of its junction with Oxford Street.

(5) Double line, 5 furlongs 0·5 chains in length, from the existing tramway in Seven Sisters Road *via* Amhurst Park to the existing tramway at Clapton Common.

(5a) Double line, 1·7 chains in length, from Amhurst Park at a junction with tramway No. 5 to Stamford Hill at a junction with the existing tramway.

(6) Double line, 1 furlong 7·8 chains in length, commencing in Hart Street, near Museum Street, *via* Hart Street, Bloomsbury Square, and Vernon Place to the existing tramway at the junction of Southampton Row with Theobald's Road.

Powers are also asked for the reconstruction of a small portion of the tramway of the Corporation of the City of London on Blackfriars Bridge and Victoria Embankment, and of the tramway of the Metropolitan Electric Tramways, Limited, in Seven Sisters Road.

Street Works.—Power is sought in this part to enable the Council to carry out street widenings in Charterhouse Street, Farringdon Road, and Vernon Place in connection with proposals for new tramways, and to enable the Metropolitan Borough Councils concerned to contribute towards the cost of such improvements.

Purchase of Lands.—This part contains powers relating to the purchase of lands for the purposes of the improvements, and is in similar terms to the London County Council (Tramways and Improvements) Act, 1915.

Motor Omnibuses.—Part V. of the Bill has been drawn to give effect to the decision of the Council on March 4, 1919, to seek legislation (i.) to enable the Council to own omnibuses, and to run auxiliary omnibus services for certain specific purposes, viz., linking up tramway dead-ends, including the provision of overlaps to traffic points, and providing auxiliary services in connection with housing schemes and proposals for tramway extension; (ii.) to enable the Council to operate omnibuses beyond the boundary of the County of London to traffic points, and to newly-developing districts and housing areas; and (iii.) to enable the Council to hold land and do all things necessary in connection with an omnibus undertaking. Provision has been made enabling the Council to apply to the proposed omnibus services certain of the Council's powers relating to the management and fares for tramways, and to make arrangements for through bookings with other tramway, omnibus, and railway services. Clause 18 (4) enables the Council to run motor omnibuses on any tramway route of the Council on which the running of tramways is interrupted. This provision is not specifically covered by the Council's resolution of March 4, 1919. Clause 20 provides that the omnibuses established under the Act shall form part of the tramways undertaking of the Council.

Miscellaneous and Financial.—This part contains provisions (i.) incorporating certain sections of the Council's Tramways Acts; (ii.) removing the limitations imposed on the Council by Section 14 of the London County Council (Tramways and Improvements) Act, 1912, in respect of the hours of user of the tramways in Tooley Street between Bermondsey Street and Joiner Street; and (iii.) enabling the Council to expend money on capital account for the purposes of the Act and to borrow money for such purposes.

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BRITISH WATER POWERS RESOURCES.

INTERIM REPORT OF THE WATER POWERS RESOURCES COMMITTEE.

With the object of obtaining a complete estimate of the hydro-electric resources of Great Britain, the Board of Trade instituted, in 1918, a special committee charged with the duty of surveying all the reasonably promising water powers in the British Isles, and investigating their economic possibilities. Last month, the committee issued an interim report dealing with nine water powers in Scotland, and outlining schemes which seem immediately practicable. The committee has taken a commendably broad view of its functions, and not only gives estimates of the probable commercial value of the proposed schemes, but also indicates the principles upon which acquisition of the water powers should be obtained and the schemes operated.

TEXT OF THE REPORT.

The interim report, which is addressed to Sir Albert Stanley, M.P., President of the Board of Trade, is as follows :—

The main purpose of this interim report is to bring to your notice certain practicable water-power schemes which may prove of assistance at once to the Board of Trade and to the Ministry of Reconstruction in providing employment for labour, not only on the works themselves but also in consequent and auxiliary trades, such as quarrying, cement making, steel constructional work, hydraulic and electrical plant manufacture, etc.

1. The committee has already collected a very large amount of data and taken evidence from a number of witnesses, while four well-known civil engineers have been retained for carrying out preliminary surveys in certain selected areas in Scotland and in North Wales. The evidence so far available to the committee indicates that there are considerable possibilities in other areas in Great Britain and Ireland, which still remain to be surveyed. The investigations required in Ireland will be carried out by the recently appointed Irish sub-committee.

NINE SCOTTISH WATER POWERS.

2. The reports in the possession of the committee dealing with a portion of Scotland alone show that nine water-power schemes hereafter referred to are capable of generating a continuous supply of 183,500 electrical H.P. corresponding to an output at the hydro-electric stations of 1,200 million Board of Trade units per annum.

The magnitude of these schemes will be better appreciated when it is pointed out that in the year 1917-18 the whole of the steam-power stations in Great Britain (public undertakings for electricity supply and for electric railways and tramways, but not private power plants) generated 4,628 million Board of Trade units and consumed 7·16 million tons of coal. Upon the basis of the present *average* practice at coal-fired power stations, the nine potential water powers thus represent the equivalent of 1·85 million tons of coal per annum.

3. In consequence of the modern developments in long-distance electrical transmission, it would be entirely practicable to transmit the electrical energy developed at these water-power stations to industrial centres in Scotland; for example, to Glasgow, the Clyde Valley, Edinburgh and District, Aberdeen, and Dundee. Allowing for losses in transmission and transformation, the nine schemes in question could deliver at least 1,000 million Board of Trade units within a radius of supply of from 80 to 85 miles.

The importance of these schemes is further emphasised by the fact that the total number of Board of Trade units generated in the year 1917-18 by all the steam-power stations in Scotland (including public utility undertakings, but excluding private power plants), amounted to about 537 million, and involved the consumption of over 806,000 tons of coal If the nine water-power schemes were fully developed, they would therefore be capable of supplying about double the present output for power, traction, and lighting purposes in Scotland.

4. As an alternative outlet for a part of this large amount of power, industries dependent upon considerable blocks of cheap power, for example, the manufacture of carbide or calcium cyanamide, or other electro-chemical or metallurgical processes, could be established close to those of the water-power stations which would be conveniently situated as regards railway and water transport.

5. The committee desires to emphasise the fact that the whole of this potential water power, which, as shown later, can be developed for the use and convenience of man at a commercially sound cost, is now running to waste. The value of these powers is brought into greater prominence by the continuous increase in the price of coal.

ESTIMATED COST OF DEVELOPMENT.

6. The nine Scottish schemes are briefly described in the following table, and their positions are shown on the accompanying map. [This map is printed in the Parliamentary Paper.] A full report upon each scheme is in the possession of the committee.

[NOTE.—Except in the case of Scheme A, the figures for the capital cost do not include an allowance for interest on capital during construction. This item would represent an addition of 7½ per cent. to the separate totals.]

Group.	Scheme.	Size. Continuous E.H.P.	Estimated Capital Cost. Total. £	Estimated Capital Cost. Per E.H.P. at power house. £	Approximate number of men required on the sites. 1st year to 3rd year.
A.	Loch Laggan ...	38,000	1,742,000	45·8	2,000—3,000
	,, Treig ...				
B.	,, Ericht ...	42,000	1,580,000	37·6	2,000—6,000
	,, Laidon ...				
	,, Rannoch ...				
	,, Tummel ...				
C.	,, Quoich ...	27,000	1,069,000	39·5	1,000—3,000
	,, Loyne ...				
D	,, Clunie ...	9,200	393,000	42·8	500— 900
	,, R. Moriston				
E.	Loch Monar ...	7,200	315,000	44·0	250— 750
F.	Lower Farrar ...	7,600	288,000	38·0	250— 750
G.	Loch Affric ...	31,000	1,133,000	36·5	750—3,250
	,, Mullardoch				
H.	Kilmorack Falls...	9,500	160,000	17·0	250
I.	Loch Awe ...	12,000	395,000	32·9	500—1,000
	,, Nant ...				
	Total ...	183,500	7,075,000	38·5 (average)	

BASES OF THE ESTIMATES.

The estimated costs of development are based upon pre-war contract prices with an addition of 50 per cent., which it is hoped will be ample to cover the post-war costs of works of this description. The costs are inclusive of all civil engineering and hydraulic works, power house, and plant, and of reasonable compensation for rights and property that would have to be acquired to carry out the developments. Materials for the construction of light railways and hutments would be available from military stores, and the costs of such materials are included in the estimates. Each scheme will take approximately 2½ or 3 years to construct; the labour required on the sites during the first and third years respectively being indicated in the last column of the table.

It may be noted that while the development of some of the above schemes would involve a certain amount of interference with local amenities, the aspect of the countryside would also be improved, owing to the fact that poor ground now liable to flooding would be permanently submerged and the area of the lochs extended.

7. Although only preliminary surveys have been made on behalf of the committee, the engineers employed for the purpose are of such high standing that the committee feels that general reliance can be placed upon the reports furnished by them. Moreover, the committee has corroborative evidence in support of some of the schemes, three of which have been thoroughly surveyed on former occasions and their costs of construction carefully taken out.

A SOUND COMMERCIAL BASIS.

8. The surveys and estimates of the nine schemes give a total continuous power of 183,500 electrical H.P. at an average cost of £38·5 per effective electrical H.P. developed at the water-power stations.

After a careful consideration of the post-war prospects of developing power on a large scale by the most modern steam turbo-electric practice, the committee has arrived at the conclusion that with similar conditions in regard to transmission and distribution, it would be possible for a water-power scheme of, say, 5,000 electrical H.P. or upwards to compete on an equality with the very best steam power station (assuming 12,500 British thermal units coal at 10s. per ton delivered), provided the cost of developing the water power did not exceed about £60 per effective electrical H.P. It will be seen, therefore, that the above schemes, individually and collectively, are well within the limiting cost for development on a sound commercial basis. In the case of schemes of smaller size situated remotely from existing power facilities, a higher capital cost per effective electrical H.P. would be permissible if the power were to be used for local requirements.

COST OF GENERATION.

9. The committee estimates that if the above schemes were fully developed and fully utilised, the average cost of the electrical energy generated, inclusive of all running expenses and capital charges, should not exceed 0·15 of a penny per unit at the water-power stations. It must be understood that such a cost would only hold in the event of the continuous use of practically the whole output by works situated near the power stations, e.g., by electro-chemical or metallurgical works. For ordinary industrial demands of a less continuous character, the cost would, of necessity, be greater.

The committee further estimates that the energy could be delivered into the industrial districts of Scotland at a cost which would be considerably lower than the present cost of electricity. The

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effects upon the districts would be markedly beneficial, smoke and dirt would be reduced, and a large quantity of coal would be saved or set free. (See paragraph 3.)

EFFECT ON LOCAL INDUSTRIES AND POPULATION.

10. If some of the schemes were utilised for the alternative purposes indicated in paragraph (4) the establishment of local industries would attract a larger population, bring about the development of transport, and also would lead to increased agricultural and dairy production to support the larger population.

The official representative of the Scottish Board of Agriculture and other witnesses have drawn attention to the serious situation in regard to the diminishing population in many parts of Scotland. These water-power schemes—and there are many others in various parts of Scotland which the committee is investigating—provide the means of promoting the resettlement of the people in or near their native location, and of bringing about developments in agriculture and dairying, and of railways or other transport facilities.

NATIONAL ASSETS.

11. The committee is unanimously of opinion that these potential water powers are to be regarded as national assets, and that any rights or property necessary for their utilisation should be acquired by the nation at reasonable and proper purchase costs.

The committee is further of the opinion that the water powers should either be developed by the State, or leased to a public or commercial undertaking for a sufficient term of years to enable the lessees to redeem the large capital expenditure by means of a small annual sinking fund which will not add unduly to the cost of the available power. This matter is at present under investigation and will be dealt with more fully in the final report of the committee.

12. If some of the above water-power schemes are to be begun at once for the useful employment of labour in 1919, the only possible way appears to be for the Government to promote a short Bill giving the Board of Trade powers to acquire the necessary rights, and for the Board to instruct the engineers at once to make further surveys where such are necessary, to prepare plans and to take out quantities, so that actual construction could be begun in the early summer.

Probably only a few of the schemes would be selected for immediate development, and the committee is prepared to advise upon this point.

OTHER BRITISH WATER POWERS.

13. The committee is in possession of further reports and estimates based upon surveys carried out in Scotland (Loch Broom area; also the area containing Lochs Glass, Morie, and Brora), and in North Wales, and promising schemes are indicated in each report. For example, there is a power in North Wales which is capable of developing 4,400 continuous electrical H.P. at an estimated capital cost of £41·8 per effective electrical H.P.

These reports are still under consideration and the schemes will be dealt with in more detail in the committee's final report.

14. Particulars have been submitted to the committee of potential powers in the Lake Districts, in Devon and Cornwall, and elsewhere. A scheme for the utilisation of the tides in the River Severn has also been put forward. It presents a number of interesting features, and is being further investigated by the committee.

15. There appear to be numerous small water powers in many parts of the country, ranging from 100 electrical H.P. to perhaps 2,000 electrical H.P. These are at present running to waste, whereas in many cases they could be usefully developed either for mills or for local agricultural and village requirements. Alternatively, the powers could be developed in automatically-worked stations, which would deliver energy into a general electrical transmission network or would serve to supplement existing coal-fired power stations. Water-power resources could thus be utilised in the same way as many sources of waste heat in this country.

The committee is proceeding with investigations in these directions.

PRINCIPLES OF DEVELOPMENT.

16. Official representatives of several English and Scottish Departments, and witnesses experienced or interested in water-power schemes, have given evidence dealing with the various claims that have to be reconciled in developing water powers, and with the general effects of such developments upon local industry, agriculture, fisheries, prevention of flooding, local amenities, and so forth.

Although these aspects of the enquiry are still under investigation, the committee feels it necessary to make certain comments at the present stage.

17. From the broad review of the position, it is abundantly clear to the committee that, in the development of the water-power resources of the United Kingdom, certain fundamental principles must be observed. For instance:—

(a) The whole of a watershed must be thoroughly studied and the fullest use made of its potential water power consistent with reasonable capital expenditure. A development which would only result in a part of the power being utilised should not be permitted, if the ultimate use of the whole available power is thereby prejudiced.

(b) Proper regard must be shown to the interests of domestic and trade water supplies, fisheries, the drainage of adjacent lands, canals, and inland navigation, and in certain cases to local amenities.
Neglect to give consideration to some of these requirements has been responsible in the past for failure in the promotion of some water-power schemes.

(c) A part of the available power must be reserved for use by the local population within the watershed, both for present requirements and also for prospective developments.

It is important to remember, however, that in the case of large water powers considerably in excess of local requirements, it would not, in general, be commercially practicable to ensure a cheap local supply of electricity unless the powers were developed to the maximum extent and the bulk of the output utilised by an industry requiring practically a continuous supply throughout the year.

THE ADJUSTMENT OF CONFLICTING INTERESTS.

18. There are two outstanding factors which have been prominent in arresting the wider development of water-power schemes on a large scale in this country, namely:—

(a) The costly, protracted, and inefficient system of obtaining the necessary authority by means of a Private Bill.

(b) The multiplicity of interests to be reconciled.

19. With regard to the former paragraph 18a the committee is of opinion that if the rights necessary for the development of all water powers above a certain size were secured by the State, as and when required, many of the difficulties experienced in the past would disappear and preliminary waste of capital be obviated.

20. With regard to the question of multiplicity of interests, there is no doubt whatever that the powers now vested in numerous departments, boards, and other bodies concerned with different aspects of the water problem, require thorough revision and co-ordination. Many of the existing interests are or may be opponents of water-power developments, and if proper use is to be made of the valuable national asset represented by the potential water-power resources of the United Kingdom, the need of a simple, inexpensive and expeditious procedure for adjusting the claims of the several interests is vital. There is no question that a river system and its drainage area must be dealt with as a whole in regard to all the water problems incidental thereto. In this connection the committee desires to draw attention to the recommendations of Lord Elgin's Commission on Salmon Fisheries, 1902, which advocated, *inter alia*, the setting up of Watershed Boards under a Supreme Rivers Authority.

THE QUESTION OF CONTROL.

At the present moment the committee does not express any opinion on the question whether unity of control could best be effected by extending and co-ordinating the powers now possessed by departments, etc., or by the appointment of a new statutory authority or authorities with executive or only co-ordinating and advisory powers. The committee wishes, however, to emphasise the importance of the question, and to point out that it is a reconstruction problem which will undoubtedly require to be specially dealt with in the immediate future. The various aspects of the question are being examined in detail by the committee. In addition, the development of water powers for electricity supply purposes has a close bearing upon the recommendations of the Board of Trade Committee on Electric Power Supply, and will require to be considered in relation to any legislative proposals to give effect to those recommendations.

IMPORTANCE OF RAINFALL RECORDS.

21. The committee wishes to draw attention to the fact that the estimates of water power dealt with in this report have only been made possible by the voluntary work of rainfall observers in all parts of the British Isles, which has been collected and discussed by the British Rainfall Organisation during the past 58 years. If the fullest use is to be made of the water-power resources of this country, it is essential that the work of observation should not only continue, but should be encouraged and developed.

Another branch of observation which has a vital bearing upon the question of water-power resources is the gauging of the flow of rivers.

NEED FOR HYDRO-ELECTRICAL TRAINING.

22. Strong evidence has been submitted to the committee regarding the lack of adequate training facilities in the universities and technical institutes of the United Kingdom for young engineers wishing to enter the field of hydro-electric development. In view of the very large extension of water-power development that is practically certain to take place in the near future, both in this country, in the British Empire, and in other countries, the committee consider it important in the interests of British industry that steps should be taken to remedy this state of affairs.

The committee recommends that its views on this matter be brought to the notice of the Minister of Education, the Secretary for Scotland, and the Chief Secretary for Ireland, and suggests that Government support should be given where necessary for the initiation of special lectureships and courses in the subject of universities and technical institutes.

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REPORT OF THE LIGHT RAILWAY COMMISSIONERS.

The Light Railway Commissioners have presented their twenty-second annual report to the Board of Trade, dealing with the proceedings of this Commission up to December 31, 1918. The report states that a total of 687 applications for Orders to authorise light railways (which includes 124 applications for amending Orders) have been made since the commencement of this Act; details as to these respective applications and results are found set out in the appendices to this and to previous reports.

Results.

The total mileage of all classes of lines applied for under the Light Railways Acts since 1896 is 5,051 miles. Applications have been granted so far as this Commission is concerned for 2,272 miles; while the Orders confirmed up to this date by the Board of Trade authorise the construction of 2,101 miles.

Of these 2,101 miles, about 900 miles have been actually constructed, of which about 550 are on lands acquired and about 350 on roads.

Treasury Advances.

Of the 550 miles on lands acquired, about 325 are either owned or worked by existing main line railway companies; this figure of 325 includes all mileage aided by free grant from the Treasury (viz., 80 miles), such working being a condition precedent thereto, and 22 miles aided by loans of Treasury money; in addition to the 22 miles worked by railway companies, 23 miles in the hands of independent light railway companies have been aided by loans, to which as distinguished from free grants the condition as to such working is not attached. The amounts involved in these Treasury advances are about £143,000 in free grants, and about £60,000 in loans; in addition, conditional promises of aid from the Treasury, viz., about £34,000 free grants and £144,000 loans, have been made in respect of 71 other miles of line, not, however, so far proceeded with. It should be stated that these advances, or promises, were for the most part made in the early years after the Light Railways Act, 1896, was passed; and that, notwithstanding the proportion still remaining available of the sums assigned by Statute (altogether £750,000 for free grants and £250,000 for loans), and notwithstanding the large mileage of light railways which cannot be proceeded with owing to lack of funds, yet responsible promoters have not found themselves in a position to comply with the conditions under which the moneys are offered under the Light Railways Acts, nor in recent years either to ask for or to obtain special assistance from the State, to any material extent. We account for this by the fact that under the said Acts only a proportion of the capital in each case may be found by the State, and that in such cases the balance of private capital is seldom forthcoming.

Longer experience has confirmed the view indicated above that, except in cases where the prospect of some particular traffic, or the furtherance of some definite interest, may invite capital from independent sources, the provision of light railways will have to be made out of public money, whether from local or national sources, and under consequent public control. In this way the essentials of cheap capital, cheap construction, and cheap working might be arrived at; and, further also, a better security that each scheme with its details should be of the kind and on the scale best adapted to the circumstances.

During the last year we have submitted to the Board of Trade eight Orders for confirmation; three new applications received in November, representing 30 miles, remain to be dealt with. Other applications still before us pending final settlement are 14 in number and represent together 86 miles in different parts of the Kingdom; their final determination has been postponed either during the war crisis, or previous thereto pending the promoters' endeavours to arrange for the finance.

Recent Orders independent of State Aid.

The eight Orders submitted in 1918 will serve to illustrate the kind of railway which, being independent of State aid by reason of some special traffic, finds under the Light Railways Acts an inexpensive and practical procedure for authorisation. Of the light railways authorised by these eight Orders, two (Edge Hill and East Kent) are mainly for mineral traffic, iron ore and coal respectively; three (Formby, Swansea, and Lostock) are principally for passengers in the neighbourhood of large populations; the remaining three (De Trafford, Hooton, and Nottingham) are promoted for the industrial organisation and equipment of selected areas of land (on the lines of the Trafford Park estate, near Manchester), starting for this purpose with the provision of special transport facilities.

The object is to concentrate the factories established there in a favourable position for production by the most economical methods, and the promoters of such estates conceive that the railway lines and sidings which serve these factories and connect them with the main line systems, should be in the hands of separate and independent companies. Some of the main line companies, however, are not prepared to accept this view, and have claimed the right to construct the special lines and sidings themselves as part of their own railway in each case.

Agricultural Policy.

In respect of a proposed light railway from Longridge to Hellifield (24 miles), our approval was conditional on the promoters either obtaining a free grant for a considerable proportion of the cost or reducing the cost (if that were feasible) by an equivalent sum. The line would run through two valleys of pasture land now devoted to stock raising; these valleys are narrow, between high ground and open moors, and the permanent population is sparse, though the country-side, when accessible, would offer attractions to visitors and holiday-makers from the working centres near by. Though the climate is soft, the soil is fertile, and with a sufficient supply of labour, and of housing accommodation, and of cheap transport would probably afford a good yield of foodstuffs and a considerable consequential traffic. We refer to this case here in some detail, because it presents a problem which may be solved by way of the national policy as to increased agricultural productiveness; unless such increase is achieved in these valleys the line does not appear worth making, and without the line it can hardly be achieved.

Co-operation with Road Traffic, etc.

It is now generally recognised that there are many districts in Great Britain where an increase of population or a development of productive industry, usually both, are likely to follow upon better economic facilities of transport; but it may be advisable to add that other facilities of transport than by rail, whether by road or by water (or by any other system which may be developed), may in some cases as our experience indicates be more suitable or better obtainable, either alone or in co-operation with the railways, or in combination with each other. The tendency in some quarters to regard these various means as competitive with, rather than as complementary to, each other, may be aggravated by treating them separately in point of procedure, and by referring them to the cognisance and authority of different bodies. It would in many ways be an advantage if matters relating to all secondary means of local transport could be referred to the same bodies, or Government Departments, for the purposes of consideration and control, so that a measure of uniformity in practice, and of co-ordination in results, may be attained. The reference to secondary means of transport (such as are inferred by the expression "light" railways) rather implies a distinction of kind from such primary services as main lines afford, yet no dividing line between them can be clearly drawn, and it is material to note this because a certain insistence on the point of competition has tended in the past to obscure the extent to which each depends upon the other.

In conclusion, the Commissioners (Messrs. H. A. Stewart and A. D. Erskine) express their deep sense of the loss sustained in October last by the retirement of Mr. Gathorne Hardy from the Commission, of which he had been chairman since 1905, to be followed by his death on November 11, 1918, and need hardly refer to the length and width of his varied experience in the administration of and in the control over railways in this country, which serve to indicate the extent of that loss and of their regret.

Orders Confirmed by the Board of Trade.

A list of the Orders confirmed by the Board of Trade in the past year, with the date of confirmation and the mileage authorised, is appended. Only one of these Orders authorises fresh construction, the length of line in that case being 6½ miles and the estimated cost £63,000.

Name of Order.	Date of Confirmation.	Mileage authorised.
	1918	
411—Lancashire and Yorkshire (Formby Light Railway)	14 Sept.	6½
412—Swansea Corporation (Extensions) (Revival and Extension of Time) ...	14 Sept.	—
	1919	
413—Edge Hill	28 Jan.	5¾
414—Hooton	18 March	1⅛

Applications made in the Six Months ended November, 1918.

1.—Ashover Light Railway.

Railways in the parishes of Stretton, Shirland and Higham, Brackenfield and Ashover, in the county of Derby.

Promoters, T. H. Jackson, Brig.-General G. M. Jackson, and J. Steen. Length, 6 miles. Motive power, steam or electric. Gauge, 4 ft. 8½ in., and 2 ft. Estimated total capital expenditure, £68,712. Engineer's estimate for cost of construction, £50,955.

2.—Barrington Light Railway.

A railway from Foxton to Barrington, in the county of Cambridge.

Promoters, the Dreadnought Cement Company, Limited. Length, 1½ miles. Motive power, steam or electric. Gauge, 4 ft. 8½ in. Estimated total capital expenditure, £13,803. Engineer's estimate for cost of construction, £13,103. This is a renewal of a scheme previously rejected.

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3.—Hooton Light Railways.

Railways in the parishes of Little Sutton, Overpool, and Netherpool, in the county of Chester.

Promoters, Herbert Levinstein and Sir Harry Duncan McGowan. Length, 1½ miles. Motive power, steam or other mechanical power. Gauge, 4 ft. 8½ in. Estimated total capital expenditure, £75,000. Engineer's estimate for cost of construction, £62,683. Local inquiry held at Chester on September 6, 1918. The application was approved

(An application made in July, 1918, under Rule 1,380. An Order was submitted to the Board of Trade on October 21, 1918.)

4.—Shropshire Light Railways.

A railway from Shrewsbury to Market Drayton, in the county of Shropshire.

Promoters, Lieut.-Col. H. F. Stephens, C. M. Mathews, and the Severn Syndicate, Limited. Length, 22¼ miles. Motive power, steam. Gauge, 4 ft. 8½ in. Estimated total capital expenditure, £199,095. Engineer's estimate for cost of construction, £160,673. Financial assistance is sought from local authorities.

This is the revival of a line for which powers given by Act of Parliament have ceased. The deposit made in respect of these proceedings has not been withdrawn; no land has been acquired and no work done.

TRAMWAY THROUGH RUNNING.

In the House of Commons, on April 29, Mr. George Jones asked the Minister designate of Ways and Communications whether he was aware that the London County Council tramway system was continuous with the Middlesex County Council tramway system at Stamford Hill, and that it would be a convenience to the public to have through running at Stamford Hill; whether he was aware that for years past there has been an insistent public demand for such through running of the trams at Stamford Hill, and that the London County Council and the Middlesex County Council have failed to come to an agreement, with the result that there is no such through running at Stamford Hill; whether under the Ministry of Ways and Communications Bill the Minister of Ways and Communications would have power to grant the right of through running to the London County Council and Middlesex County Council, and to settle the terms thereof; and whether, if the Ministry of Ways and Communications would not have the said power under the Ways and Communications Bill, he would propose an amendment to secure such power?

Sir Eric Geddes: Under the Ministry of Ways and Communications Bill, as at present drafted, the Minister would not have the power to control the through running of trams belonging to local authorities. The Government have, however, been pressed by members of the committee now considering the Bill to insert a clause which would give to the Minister power of control over municipal tramways, and the Home Secretary has intimated that a clause to this effect would have the sympathetic consideration of the Government.

YORKSHIRE AND DISTRICT TRAMWAY MANAGERS' ASSOCIATION.

At a meeting of Yorkshire and District Managers at Doncaster, the following members were present:—Messrs. E. S. Rayner (Doncaster), R. H. Wilkinson (Bradford), H. Jagger (Rotherham), W. E. Nicoll (Barnsley), J. V. Moinet (Scarborough), A. A. Blackburn (Huddersfield), J. W. Hame (York), H. England (Wakefield), E. A. Paris (Yorkshire Woollen District), H. L. White (Grimsby), and H. Webber (Keighley). After luncheon, the members adjourned to the car sheds and inspected the car that had been equipped with top-deck seats invented by Mr. Rayner. A meeting was afterwards held in the tramway offices, at which the agreement recently made between the Tramways Association and the Transport Federation was discussed.

NATIONAL TRAMWAY AGREEMENT.

Considerable differences exist between tramway employers and employees with respect to the interpretation of the agreement arrived at on March 20, and meetings have taken place at which these points have been discussed. The Licensed Vehicle Workers' Union at Bristol has complained to the Bristol Trades Council alleging a breach of agreement by the Tramways Company. Clauses Nos. 1 and 4 of the agreement are involved. Clause No. 1 provided that the previous wage for 57 hours should be paid for 48 hours. Clause 4 covered an arrangement for a conference between the employers and the men prior to the split duty being put into operation.

Electrical Trade with Poland.—The *Board of Trade Journal* reports that the electrical industry in Poland, owing to the proposed greater utilisation of electric power, will require to import turbines and motors for the re-equipment of mechanical workshops destroyed during the war.

AMERICAN STREET RAILWAY CRISIS.

Plans for Meeting the Situation.

A notable event at the mid-year meeting of the American Electric Railway Association, held at New York, was the presentation of the report of the committee on readjustments, which was presented by Mr. Gadsden, their chairman, as appended:—

Your committee believes that the questions submitted to it must properly be divided into two phases: (1) those dealing with urban street railways; (2) those dealing with inter-urban street railways; and that while the condition of both systems are in the main, the same, and while the causes of the condition are practically identical, the remedy often differs.

Your committee now has under consideration plans which, it believes, will assist in meeting the situation confronting the industry. These will be reported to you from time to time in detail. In its opinion, there are certain fundamentals which must control the readjustment of the relations between the companies and the communities they serve, and it presents for your consideration the following summary of these fundamentals:—

(1) That the electric railways are breaking down under present conditions of operations. As a result, the public is being deprived of service and is facing certain financial losses through the depreciation of electric railway securities which are largely held by savings banks, life insurance and trust companies and other similar institutions in which its savings are invested.

(2) That this condition is primarily due to the economic error of establishing an inflexible fare regardless of the cost of the service rendered or the distance hauled.

(3) That to correct this difficulty, flexible fares must be established which will be automatically adjusted to the cost of the service demanded by and furnished to the community.

(4) That a necessary element of the cost of service is such a return on the fund employed as will attract capital to the public service. To provide incentive to enterprise and initiative there must be an additional reward for economic management.

(5) That in the interest of the car rider, who must ultimately pay the cost of local transportation, every special impost and tax which cannot be justified upon the ground that it is payment for benefits received should be abolished.

(6) That to secure satisfactory service and keep fares as low as possible, the public must act on the principle of the "greatest good to the greatest number" and must co-operate with the operating companies in making effective economies by the use of "skip-stops," one-man cars, etc.; the speeding-up of schedules by reduction of vehicular interference.

(7) That electric railway transportation is a community problem to be solved by the community and the company acting together, and animated by a spirit of civic interest and devotion to the public service and having as its objective the establishment of such regulations as will give the public the greatest efficiency, economy, and enterprise in the operation of their transportation utilities.

(8) That the committee proposes to carry out as rapidly and as effectively as possible, the following programme:—

(*a*) To furnish to members of the association at as early a date as possible, information concerning franchise settlements and agreements along service at cost and other lines:

(*b*) To analyse these various agreements and present for the information of the companies such a summary of their provisions as will provide a guide in the drafting of new ordinances or agreements.

(*c*) To directly assist communities in which the readjustment of franchise relations are under way.

(*d*) To furnish at the instance of the railway company to civic organisations and similar bodies, information as to, and studies of, public utility questions.

In conclusion your committee recommends that the scope of the association's activities be so enlarged as to provide machinery for carrying out the purposes set forth herein.

In adding some remarks to the report, Mr. Gadsden stated that the committee's investigations confirmed that the condition in which the companies found themselves was not attributable entirely to the war, and that the war only emphasised the fact that the operating expenses of the railways were devouring them when their income was fixed.

The association have engaged the services of Mr. James W. Welsh as special engineer, and is prepared to assist member companies in the way of supplying information on practically all subjects pertaining to the operation of electric railways.

The Trolleybus.—Railless, Limited, of 56, Moorgate Street, London, E.C., have issued a reprint in an attractive form of an article on "Trolleybus or Motorbus," which appeared in a recent issue of The Tramway and Railway World. The pamphlet contains several interesting illustrations showing the flexibility of the railless system. Among the views are included trolleybuses at Shanghai, Bloemfontein, Bradford, Leeds, and Ramsbottom.

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WAYS AND COMMUNICATIONS BILL.

SHAPING THE MEASURE IN COMMITTEE.

The Standing Committee on the Ministry of Ways and Communications Bill began its sittings on Tuesday, April 1. It was agreed that the Committee should sit on Tuesday, Wednesday, and Thursday, from 11 to 1, and from 4 till 6.

Clause 1, appointment of Minister of Ways and Communications, came under discussion. The clause provides that for the purpose of improving the means of, and the facilities for, locomotion and transport, it shall be lawful for His Majesty to appoint a Minister of Ways and Communications, who shall hold office during His Majesty's pleasure.

Mr. Joynson-Hicks moved an amendment designed to limit the control of the Minister to Railways, but the amendment was rejected.

The Member for Twickenham returned to the charge with another amendment, moving that words should be inserted, "providing for the creation of a Board of Ways and Communications," instead of the Ministry contemplated by the Bill. Discussion of this amendment occupied the remainder of the sitting.

On Wednesday, April 2, discussion of Mr. Joynson-Hicks' proposal to amend Clause 1 of the Bill by provision of a Board instead of a Ministry was resumed. On the undertaking of the Home Secretary, Mr. Shortt, on behalf of the Government, that the Minister would have power under the Bill to set up consultative committees on the lines enacted by the Merchant Shipping Act, the amendment was withdrawn, and Clause 1 passed.

Clause 2 contains the crux of the Bill, defining, as it does, the powers of Ministry, which include control over railways, light railways, tramways, canals, waterways, roads, bridges, ferries, harbours, docks and piers, and the supply of electricity. Amendments were successively moved to omit light railways, tramways, and roads and bridges, many interesting points being raised in the course of discussion. With regard to light railways, Mr. Shortt stated that the Ministry would consult authorities on the best form of light railway, and the positions where they would be most advantageously placed. The Government considered that these lines were an integral part of the means of transport, and necessary to the industrial life of the country, and they could not consent to leaving them out of the Bill. The amendment was withdrawn. Similarly, the proposal to leave tramways outside control of the Ministry was negatived, Mr. Shortt pointing out that the powers taken over were exactly those already exercised by the Board of Trade.

The amendment proposing to omit roads, bridges, and ferries from control of the Ministry provoked serious discussion, but the Government refused to budge, and on a division they were supported by 38 votes to 8.

Sir W. Raeburn moved that "harbours, docks, and piers" be omitted from the Bill, and discussion of the amendment was continued over the greater part of Thursday's sitting. The amendment was rejected by 32 votes to 15.

A critical stage in the progress of the Bill was reached when the Committee proceeded to discuss the amendment proposed by Mr. Joseph Johnstone excluding the electricity proposals from the Bill. From the start it was evident that there must be some amendment made on the Government proposals, and the whole question aroused the keenest interest. As it was impossible to deal with such an important subject at the tail-end of an exhaustive sitting, the debate was adjourned till Tuesday, April 8. At the opening of Tuesday's sitting,

Mr. Shortt, on behalf of the Government, stated that when the Bill was drafted they hoped that the Electricity Bill, to be brought in by the President of the Board of Trade, would have been passed into law, and they included transfer of all the powers connected with electricity to the new Ministry on the assumption that the question of electricity supply had been settled. Owing to the illness of the President of the Board of Trade, however, this had been impossible. The Government were as convinced as ever that the control of electricity should be in the hands of the Department of Ways and Communications, but they accepted the amendment on the ground that it would be better to deal with the whole question when the Electricity Bill was introduced.

Mr. Joynson-Hicks moved an amendment deleting from Clause 2 words conferring upon the new Minister powers to transfer any powers of any Government department, with respect to the appointment of members, or the procedure of the Railway and Canal Commission, or of any Commissioners, Conservancy Boards, or other body Mr. Shortt said that the Government proposed to add words providing that "Nothing in the section shall transfer to the Minister the powers of the Board of Trade in respect to the appointment of members, or the procedure of the Railway and Canal Commissioners, but His Majesty in Council may by Order of Council transfer these powers to the Secretary of State instead of to the Ministry." With this addition, the amendment was agreed to.

Mr. J. D. Gilbert moved an amendment to Clause 2, the effect of which was to provide for the transfer to the new Ministry any powers of any Government department with respect to the bye-laws, regulations, orders, licences, approvals, or consents relating to any matters mentioned in the clause. He said that they thought in London that if they were to have one transport authority, and that transport authority was going to deal with tramways, it ought also to deal with motor omnibuses. The amendment was carried on a division by 17 votes to 10.

Sir Eric Geddes moved an amendment to delete the word "tramway" from the clause, and to insert words giving power to take possession of a tramway, other than a tramway, or light railway used as a tramway, belonging to a local authority. Mr. Joynson-Hicks asked if the Government were afraid of the municipalities. Sir Eric Geddes said that tramways were valuable undertakings belonging to the communities directly, and it was thought that they should be excluded from the scope of the Bill.

Discussion of Sir Eric Geddes' amendment was resumed on Wednesday, April 9 Mr. Renwick expressed the hope that, if the new Ministry obtained control of tramways, care would be taken that all tramways should have the same gauge. Great inconvenience was caused in connection with the tramway running from Newcastle to Tynemouth by the existence at the latter town of a narrow gauge line. The new Minister should also take care that municipalities who refused running powers over their systems were compelled to grant such running powers

Sir William Pearce argued that there should be in the Bill some provision, short of taking possession or of purchase, which would give the Government reasonable control over such undertakings as municipal tramways. He suggested that the Home Secretary should bring forward a new clause, giving some control over municipal tramways.

Sir Frederick Hall said the Minister-designate had stated, on the second reading of the Bill, that the tramways undertakings were paying 7 per cent. He pointed out that the gigantic and well-managed tramways undertakings of the London County Council were not paying such a percentage. Municipal tramways, in his opinion, should not make a profit, for the reason that they were worked on behalf of the ratepayers. The great idea was "to give a pennyworth of tramway for a penny." He rather agreed with the amendment, because the tramways, as a rule, were run in a competent manner.

Mr Shortt, replying to the discussion, admitted that he was impressed with the suggestion of Sir William Pearce that there might be in the Bill some general clause which would give power of control over such exempted services as municipal tramways. If a clause were suggested, the Government would be glad to consider it very sympathetically.

The amendment was agreed to.

Clause 3 (power to control temporarily railways, etc.) came under discussion at the sitting on April 10. Sir William Pearce moved that the Port of London Authority should be excluded from the undertakings to be taken over by the new Ministry. Mr. Shortt summed up the discussion with the remark that not one shred of a reason had been put forward to show why the Port of London should be excepted from the Bill rather than any other port. He refused to accept the amendment, and on a division the Committee supported the Government by 23 votes to 9.

Mr. Shortt moved an amendment, which was accepted, the object of which is to protect from the operation of the Bill privately owned railway wagons, and craft owned or held by the undertaking of which possession is taken by the Ministry.

Alterations in phrasing were effected by several amendments, the object being to define accurately the scope of the Bill in those particulars. Mr. Joynson-Hicks, however, brought the Committee back to facts by moving that any "rates, fares, dues, and other charges directed by the Minister" should be made subject to the existing rights of any person or body to apply to the Railway and Canal Commission in respect of any increase or undue preference. The Home Secretary admitted the importance of the question to the business community, and intimated that, before next meeting, he would endeavour to suggest alternative words setting up an advisory body of a semi-judicial character upon which the interests of traders would be represented.

On April 30 the Committee resumed sitting, and Mr. Shortt announced that a new clause had been drafted by the Government setting up a special advisory committee on rates, tolls, dues, etc., and he considered that committee would entirely safeguard the interests of traders. The proposed clause, which stands in the name of Sir Eric Geddes, contains six sections. It was pointed out that so great a change could not be discussed at such short notice, and after some debate a motion to report progress was carried without a division, the Committee adjourning after having sat for about twenty minutes.

At the resumed sitting on Thursday, May 1, the constitution of the proposed advisory committee on rates, etc., was discussed, and finally the number of the members of the Committee was fixed at six, giving due representation to all the interests involved. An amendment by Sir Eric Geddes, designed to safeguard agreements made by owners of undertakings previous to being taken over by the Government, was accepted.

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EFFECT OF CONCESSIONS TO EMPLOYEES UNDER THE NATIONAL AGREEMENT OF MARCH 20.

The Municipal Tramways Association, in view of the new agreement with the employees throughout the country providing for a 48-hour working week, the text of which was published in our issue of April 10, have approached the Government for the necessary powers to increase tramway fares. It is estimated that the new arrangement will impose an additional charge on the London County Council Tramways of £360,000 a year, and the wages bill of other tramway undertakings will be increased proportionately.

Birmingham tramway service has not suffered from the transition from the 54-hour week to the 48-hour week, though at least 200 men will have to be added to the staff in order to meet the new conditions. At present the men complain that owing to the traffic requirements they are unable to do their eight hours without a break, and in some instances it has taken as much as 17 hours for them to work their turns. "Birmingham," said Mr. J. Crump, of the Amalgamated Association of Tramway and Vehicle Workers, "is the only city where such heavy traffic both morning and night requires all the available men to work the service." It is hoped that arrangements will be made so that in future the men can do their eight hours in at least twelve. The tramways department has reported to the Tramways Committee that the concessions granted to the workers involve an increase in the costs of operating amounting to over £160,000 per annum. The Finance Committee, who have examined the proposals and the bill of costs, state that the increase of £160,000 referred to, and the probability of further serious expenditure, must involve an immediate increase in the tramway fares.

At Coventry Town Council meeting, Mr. Wale moved the adoption of a recommendation from the Tramways Committee:—"That application be made to the Board of Trade for their consent, under the Statutory Undertakings (Temporary Increase of Charges) Act, 1918, to an increase in the scale of charges not exceeding 50 per cent. above the existing statutory rates; and that, subject to such consent, a new scale of charges be adopted." Mr. Wale referred to the increases in wages which had been initiated by the Government and the Transport Workers' Federation. The position was that in the current year the increased wages of £2,250 were not included in the accounts, and owing to the increased amount of £9,750 decided upon by the Government and transport workers, their wage bill in 15 months would be increased by £12,000. They proposed to increase as far as they legitimately could their charges 50 per cent.—the maximum allowed by the Act. They proposed to do it in a way that would cause little inconvenience. He hoped they would secure the consent of the Board of Trade, or next year the ratepayers would be saddled with a charge of something like £12,000. Mr. F. Lee seconded the resolution, which was carried.

Mr. J. D. R. Cox, general manager, and Mr. R. Aitken, accountant of the Edinburgh and District Tramways Company, met the Tramways Committee of the Edinburgh Corporation on April 3 at an emergency meeting, and explained the position of the company with regard to the proposed reduction in the hours under the national agreement. The change would involve the company in a heavy loss unless they were permitted to increase the fares. The tramway employees had given notice to cease work on Sunday unless the company accepted the national agreement. An application had been made to the Board of Trade for an increase in fares, and the company asked the consent of the Corporation to the application. The committee agreed to support the application for sanction to an increase of the 1d. fare to 1½d., on the understanding that the tramway company would accept the national agreement. Subsequently the Board of Trade refused the application for powers to increase fares until evidence had been submitted by the company as to the financial effects of the changes in the hours and wages of the employees.

Councillor R. H. Swain, chairman of the Nottingham Tramways Committee, said that in 1914 the amount of wages was £46,200, electrical energy cost £27,900, and other expenses amounted to £31,000, making the cost per car-mile nearly 7½d. Under the 48-hours' agreement, with the same mileage as last year, the cost in wages alone would be £114,083, and including all other expenses the cost would be approximately 1s. 3d. per car-mile, or exactly double what it was in 1914. In addition, large sums would have to be spent in rolling stock and permanent way. Already the sum of £24,000 had been spent, and there was the cost of 25 new cars. Prior to the war their cars cost £940, and the last quotation was £2,300. Any reduction in the fares was impossible unless they made the undertaking a charge on the rates.

At Derby, under the national agreement, the working week has been reduced from 60 hours to 48, and the men are paid as for 57 hours. This entails a further addition to the extent of nearly £20,000 per annum. It has been decided to work with two shift service of employees. Where that is impossible the employees will be paid overtime rates. The Tramways Committee proposed to increase the fares, making the minimum for adults, except on workmen's cars, 1½d., and for children over three and under twelve, 1d. All the penny fares are thus abolished for adults, with the exception of the workmen's fares. Derby Town Council accepted the proposal.

Mr. W. T. Robson, general manager of Southampton Corporation Tramways, has stated that the reduction to 48 hours in the working week will entail an increase in the traffic staff of at least twenty pairs of men, and an increase in the wages bill of £12,000 per annum. To meet the situation it will probably be necessary to increase the existing fares by 50 per cent.

Birkenhead Corporation do not propose at present to increase the fares. Owing to the 48-hour week coming into operation, it has been necessary to increase the staff, but the Tramways Committee hope to avoid the necessity of alteration in fares.

Now that the 48-hour week is in operation, the Aberdeen Tramways Committee, like many others, are faced with a difficult financial problem. It has been estimated that there will soon be a deficit at the rate of from £500 to £600 a year in spite of the increased revenue. Halfpenny fares have always resulted in a loss, and it is possible that they will have to be abandoned. Hitherto the average length of the halfpenny stage has been 1,025 yards, and the average distance a passenger could travel for a penny was 1,716 yards.

It is estimated that the additional cost of the new arrangement to the Brighton Tramways Committee will amount to about £8,000 a year. The working week has been 60 hours, and this is now to be reduced to 48, with pay as for 57 hours.

At a meeting of the Wallasey Town Council Mr. W. H. Griffin, vice-chairman of the Tramways Committee, said that the recent arrangement for a 48-hour week for the tramway workers involved an increase of £10,000 a year in addition to the previous grants.

Bath Tramways Company will incur an additional yearly expenditure of £6,400 as a result of the reduction in the working hours from 58 to 48 per week. The total wages bill is now practically double the pre-war amount. Having obtained the sanction of the Board of Trade, the company have raised their fares on most routes about 50 per cent., the alteration taking effect on April 17. Wages paid by the company have increased £11,000 in the past twelve months.

At a meeting of Glasgow Corporation on April 3, Mr. Kelly, convener of the Tramways Committee, said that they were expecting a report from Mr. Dalrymple, the general manager, on the subject of tramway fares, and the report would be communicated to the Corporation.

To meet the additional charge for wages involved by the new national agreement, estimated at £140,000 per annum, Liverpool Tramways Committee recommended increase of fares on the basis of 1d. for 1½ miles, with proportionate increases for longer stages. The recommendation was accepted by the City Council.

Hull Corporation Tramways Committee recommended that the halfpenny fares for morning travellers be abolished, and several readjustments of ordinary fares, in order to meet the extra cost involved by the reduction of hours and increase of pay granted to workers by the new agreement accepted by the tramway authorities of the country.

Six additional members of the Exeter Town Council were appointed to confer with the Tramways Committee in regard to the proposed increase in the scale of fares. As a result of their deliberations, the Consultative Committee presented a scale of increased tramway fares to the Town Council. On the understanding that the scheme would come up for ratification or amendment three months from the date it is put into force, the scheme was adopted by the Council.

The new national agreement came into operation in Burnley on March 26. It is estimated that the introduction of this system will involve an increase in the expenditure of the Burnley tramway department of about £10,000 per annum. The changes are so far-reaching in effect that a considerable time must elapse before the conditions of the agreement can be fully applied.

At a conference between the Bradford Tramways Committee and representatives of the employees, details were discussed in connection with the 48-hour week granted to tramway employees throughout the country. The existing rates of pay will continue, and it has been arranged that a limited amount of overtime should be worked where necessary, to be paid for at overtime rates.

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A sub-committee of Dundee Town Council Tramways Committee has reported that, owing to the increase in employees' wages involved in the recent new agreement, estimated to amount to about £12,000 per annum, and, further, owing to the additional outlay of about £2,500 on streets, it would be necessary to adopt some means whereby the increase might be met. The Tramways Committee has accordingly recommended that the tram fares should be raised by about a halfpenny on all the longer distance routes. Workmen's fares are to remain the same, and through tickets are to be abolished. The committee points out that the wages bill for the week ending April 12 was £971, as compared with £371 in the corresponding week of 1914.

The Tramways Committee has presented a report to Croydon Town Council stating that the estimated cost of carrying into effect the new terms of agreement with the employees was £28,000 a year. The committee submitted a revised list of fares and stages by which it was hoped the increased expenditure would be partially met. The Council refused to accept the report, and referred it back for further consideration.

Kirkcaldy Town Council Tramways Committee has intimated that, in view of the increased cost of operation caused by the high cost of materials and increases in wages, tramway fares must be raised by at least 100 per cent. Decision has been delayed, however, till the close of the financial year on May 15th.

The London General Omnibus Company on April 13 made further alterations in motor omnibus fares, in continuation of the changes which came into operation on March 27. The increases have been made in order to meet the additional working costs caused principally by higher wages and the high price of fuel.

The London United Tramways on April 12 made further increases in their fares, and the charge is now 1d. per mile for ordinary passengers and ½d. a mile, minimum 1d., for workmen. Before the change in fares in January the average 1d. stage was 2¾ miles in length for ordinary passengers, and in some cases the distance that could be travelled for this sum was over three miles.

Fares on the Burton-on-Trent Corporation Tramways have been increased by about 50 per cent., the minimum fare being now 1½d.

Considerable differences exist between the tramway employers and employees with respect to the interpretation of the agreement arrived at on March 20, and meetings have taken place at which the points have been discussed, but a settlement has not yet been reached. The Licensed Vehicle Workers' Union at Bristol has complained to the Bristol Trades Council, alleging a breach of agreement by the Tramways Company. Clauses Nos. 1 and 4 of the agreement are involved. Clause No. 1 provided that the previous wage for 57 hours should be paid for 48 hours. Clause 4 covered an arrangement for a conference between the employers and the men prior to the split duty being put into operation.

JOINT INDUSTRIAL COUNCILS.

Alderman Flint, chairman of the Leicester Corporation Tramways Committee, at a recent meeting of the Council, referred to the formation of the Joint Industrial Council for the Tramway Industry, the constitution of which was given in full in our issue of March 13, 1919. All the tramway companies, said Alderman Flint, had fallen into line in the matter. There would be representative district committees, and if a difficulty arose which only affected Leicester, then the representatives of that undertaking and their employees would endeavour to settle it. If they could not do so, it would then have to go to the Council for the area, and, if they failed to agree, then to the national body. The main idea was to prevent friction.

WHITLEY COUNCIL FOR THE ELECTRICAL INDUSTRY.

The first meeting of the Joint Industrial Council for the electricity supply industry was held in London, on May 1. Mr. G. J. Wardle, M.P., Parliamentary Secretary to the Ministry of Labour, said it was the fourth Council established for industries or services in which local government authorities are concerned, the Councils for the waterworks industry, local authorities' non-trading services, and the gas industry having held their first meetings. The Councils for the electricity supply, gas and waterworks undertakings industries include both municipal and company-owned undertakings. Alderman W. Walker, of the Incorporated Municipal Electrical Association, was elected chairman, and Mr. A. de Turckheim, secretary of the Incorporated Association of Electric Power Companies, was appointed secretary *pro tem.*, for the employers' side of the Council. The trade union side of the Council will nominate the vice-chairman, and will appoint their secretary at an early date. All communications should be forwarded for the present to Mr. A. de Turckheim, Sanctuary House, 33, Tothill Street, Westminster, S.W.1.

INCREASE IN LONDON TRAMWAY FARES.

The annual cost to the London County Council of giving effect to the national agreement between tramway employers and employees providing, among other concessions, for a 48-hour week, is estimated at £360,000. The effect of this charge on the tramways undertaking has been carefully considered by a sub-committee presided over by Mr. W. J. Squires, chairman of the Highways Committee, and as a result the committee made certain recommendations to the Council, which were approved on April 15. The new arrangement came into force on April 27 and the 1d. stage was reduced from 1·8 miles to 1·5 miles, with a single overlap in place of the present double overlap. The general effect is to add 1d. to each existing fare distance. Each route is divided into sections of ·75 miles, two consecutive sections being traversed for 1d., four for 2d., etc. Under the old arrangements the sections are of an average length of ·6 of a mile, and any three of these could be traversed for 1d. The increased revenue anticipated from the revision is £416,000, while a saving of £40,000 is anticipated from the improved fare collection owing to the shortening of the stages and the reduction in the hours of work for the employees.

The following scale has been adopted for workmen's return tickets: For a return journey over a stage of 2 miles (total journey 4 miles) 2d., over a stage of 3 miles (total journey 6 miles) 3d., 4 miles (total journey 8 miles) 4d., and above 8 miles total journey, 5d.

The Highways Committee in their report stated that the upward trend of wages had been continuous since 1914, as shown in the following comparison:—

	1913-14	1918-19	1919-20 (est.)
Total wages bill ...	1,102,220	1,888,600	2,421,250
Car mileage ...	59,209,289	48,052,801	53,000,000

War service allowances to men during the year 1918-19 amounted to £180,000, and the estimate for the current year for the smaller number of men still on service is £50,000. Simultaneously with the increase of wages the price of coal and materials has advanced in many cases more than 100 per cent. Another factor is the urgent need for renewals of track and paving, which it has been impossible to carry out during the war owing to the shortage of labour and the impossibility of obtaining materials.

The working expenses since the year 1913-14 are given below:—

Year.	Car miles run.	Working expenses.	A car mile.
		£	d.
1913-14	59,209,289	1,585,251	6·50
1914-15	58,978,792	1,684,243	6·89
1915-16	47,879,675	1,683,660	8·44
1916-17	49,478,973	1,817,693	8·82
1917-18	49,189,866	2,128,685	10·38
1918-19 (est.)	48,052,801	2,811,465	14·04
1919-20 (est.)	53,000,000	3,521,925	15·94

The renewals fund, which at March 31, 1914, stood at £539,749, at March 18, 1918, was reduced to £324,451. Up to the year 1911-12 a provision of two-thirds of a penny for each mile run had been paid to the renewals fund, but for the last six years provision could not be made on this basis, but the available surpluses have been paid into the fund. The general reserve fund on March 31, 1918, stood at £74,667, against £190,596, on March 31, 1914.

In May, 1917, the halfpenny fares were suspended and the average distance for a penny was reduced from 2 miles to 1·8 miles, and other reductions were made.

Prolonged debates took place on the proposals, Mr. G. Dew moving the reference back.

Mr. Davis (Labour Alderman) seconded, and urged as an alternative that the expenditure should be carefully watched for the next three months. If then it were found that the fares must be increased he and his party would support the committee and even consider the question of abolishing workmen's fares.

Mr. H. H. Gordon said delay was only a negative policy. It was obvious pre-war fares could not be continued.

The amendment was defeated by 94 to 28.

Mr. E. Davis moved, and Mr. Gosling seconded, an instruction to the Highways Committee to report as to the increased charges falling on the tramways during the next three months, and as to the road and other charges which the undertaking had to bear.

This was defeated by 94 to 18, and Mr. H. H. Gordon moved that the committee should consider the report on the charges imposed on the tramways which operated unfairly as compared with the charges imposed upon the omnibuses, and bring up recommendations for removal. This was lost by 48 to 60. Other amendments to secure the restoration of transfers were rejected, and eventually all the recommendations of the committee were adopted.

Protection for Tramway Passengers.—A Liverpool stipendiary on April 30 fined a chauffeur for driving into a crowd of tramway passengers leaving or boarding a car, who had to scatter in all directions to avoid injury. The stipendiary said such offences were becoming more common, and must be punished severely in the future.

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GLASGOW TRAMWAY FARES.

Schemes Abolishing Halfpenny Fares.

The increased expenditure of the Glasgow Corporation Tramways was discussed at a meeting of the Finance Sub-committee of the Tramways Committee on May 1, when the general manager (Mr. J. Dalrymple) presented a report on the position. In the course of his discussion, Mr. Dalrymple stated that every reduction in fares since the Corporation took over the tramways in 1894 had resulted in increased traffic revenue. It was now absolutely necessary to further increase this revenue in order to meet the increase in wages and the high cost of materials. It had been suggested that the further increase in revenue required should be obtained by a further reduction in fares. It must be quite clear, however, to anyone who had been observing the car traffic for the past two or three years that the department could not, with the present plant, carry any more passengers. To do so there must be more cars and better facilities for conducting the traffic through the centre of the city, and this would mean a very large addition both to capital and annual expenditure. Although additional cars were in course of construction it would be some months, owing to the great difficulty in obtaining materials, before any considerable number of these would be in service. What was wanted was an increased revenue from the present service. No one would surely suggest that more passengers should be crowded into the cars. In America it was quite common for a tramway undertaking to carry an average of six to eight passengers per car-mile, and in this country they used to consider 11 or 12 a very good average. During the past few months the average number of passengers per car-mile in Glasgow had touched 20. Yet this overcrowding was, under present conditions, absolutely necessary. Were it not for the overcrowding the financial position of the department would be hopeless. With an average revenue per passenger of ·78d., or about three farthings, it was impossible to make ends meet. Glasgow was perhaps the only place in the kingdom, may be in the world, where tramway fares were still as they were in 1914. With the present revenue only an immediate reduction in wages and in the cost of material would enable the department to meet its obligations.

Financial Position.

For the year ending May 31, 1918, the revenue was £1,421,215, and the expenditure £1,243,662, a surplus of £177,553. This result might at first sight appear to be highly satisfactory, but no charge appeared in the expenditure for interest on capital, and no provision had to be made for sinking fund. Of course it was not necessary to make any provision for sinking fund, as there was no debt to redeem. The result, however, could scarcely be said to have been satisfactory when the total surplus did not reach 5 per cent. on the capital investment. Some contended that it was not now necessary to charge revenue with interest on capital, as the indebtedness was all wiped off. It was hoped, however, that the Corporation would insist on a reasonable return from the tramways on the £4,000,000 invested in the undertaking. Mr. Dalrymple estimated that the revenue of the financial year which ends on May 31 would be £1,521,215, and the expenditure £1,474,800, a surplus of £46,415. The amount set aside for depreciation, £124,000, was the same as for the previous year, though that sum was now, on account of the great increase in the cost of materials and wages, quite inadequate.

The Increase in Wages.

The wages bill for the year 1913-14 was £441,048; last year it was £649,749; for the current year it was estimated at £830,000; and for next year at £950,000. The estimated revenue for next year was £1,571,000, and the expenditure £1,736,560 (including £245,000 for depreciation and renewals), showing a deficit of £165,560. His estimate of £50,000 increase in revenue was based on the assumption that work would be plentiful throughout the year and that wages would not fall. The cost of uniform would show an increase of about £20,000. Repairs and maintenance would show an increase of about £100,000. If they got the necessary material they would spend during the next twelve months on the track alone over £200,000. If one were satisfied that the present conditions were of a temporary nature it might be possible to carry on with the present fares. They were told, however, that wages were likely to remain, if not at the present level, at a much higher than the pre-war level. The present traffic conditions could not be allowed to continue, and the improvement of these conditions would cost millions. This money would require to be borrowed, and revenue would require to be raised to meet interest and sinking fund.

Halfpenny Fares.

In 1894 the Corporation started with a fare of ½d. for a half-mile stage and 1d. for a mile or thereby. The ½d. distance remained without change until 1911, when twice the distance was given. Prior to that date all the higher fares had been altered from time to time. Even in pre-war times no tramway undertaking in the country had anything approaching the number or percentage of ½d. passengers shown in the Glasgow traffic returns. Last year 63½ per cent. of all passengers carried in Glasgow only paid ½d. fare.

Schemes for Fare Revision.

Mr. Dalrymple suggested five schemes by which an increase in fares could be effected.

(1) By reverting to the scale of fares which obtained prior to 1901:—½d. one stage, ·58 of a mile; 1d. three stages, 1·74 miles; 1½d. five stages, 2·90; 2d. six stages, 3·48; 2½d. eight stages, 4·64; 3d. ten stages, 5·80.

(2) By charging ½d. per stage:—½d. one stage, ·58 of a mile; 1d. two stages, 1·16 miles; 1½d. three stages, 1·74; 2d. four stages, 2·32; 2½d. five stages, 2·90; 3d. six stages, 3·48.

(3) A ½d. added to each of the present fares would work out:—1d. two stages, 1·16 miles; 1½d. four stages, 2·32; 2d. six stages, 3·48; 2½d. eight stages, 4·64; 3d. ten stages, 5·80.

(4) A scheme somewhat more favourable to the passenger would be to abolish the ½d. fare, but to give three stages for 1d. instead of two, as in Scheme No. 3, and to give two stages for each additional ½d.:—1d. three stages, 1·74 miles; 1½d. five stages, 2·90; 2d. seven stages, 4·06; 2½d. nine stages, 5·22; 3d. eleven stages, 6·38.

(5) Another scheme proposed was to accept only a special token with a face value of ¾d. for the present ½d. distance; these tokens to be purchased in quantities at face value, and no cash to be accepted for any fare less than 1d. The scale of fares under this proposal would be:—¾d. two stages, 1·16 miles; 1d. three stages, 1·74; 1½d. four stages, 2·32; 2d. six stages, 3·48; 2½d. seven stages, 4·06; 3d. nine stages, 5·22.

Commenting on the various schemes, Mr. Dalrymple said there was no doubt that the ½d. fare was a great boon to those who had to use the cars frequently for short distances and for those who went home for a midday meal, but the time had come when even the short distance passenger should pay more. He was convinced that the larger income necessary to meet the increased expenditure could only be obtained by raising the fares, and that the simplest and most equitable arrangement was to add ½d. to each of the present fares.

SHEFFIELD THREE-HOUR STRIKE.

Recently very conflicting and almost unintelligible reports have appeared in the public Press regarding the strike of Sheffield tramway employees which took place on Sunday, April 27. At a meeting of Sheffield Corporation Tramways Committee, held on Tuesday, April 29, the subject was discussed, and an official report was supplied to the Press, of which the following is a summary:—On Sunday, the 27th inst., in consequence of a dispute regarding the interpretation of the agreement dated March 20, which had been arrived at between the representatives of the Municipal Tramways and the National Transport Workers' Federation, the traffic employees held a meeting on the morning of that date and passed a resolution that until certain disputes with regard to the interpretation of the agreement had been settled in their favour, no man was to be allowed to leave the meeting-room, and the cars were not to be taken out in accordance with the time tables for Sunday noon. The general manager reported that having addressed the meeting, ascertaining exactly what their objections were to the interpretation that was being placed upon the agreement, he had endeavoured so far as was reasonably possible to meet the wishes of the men in regard to the matter, and fixed up, at any rate as a temporary measure, the working arrangements until such time as the new duty sheets could be brought into operation. The Committee having heard the full report of the general manager in regard to the meeting and negotiations that had taken place, expressed their grave disapproval of the unwarrantable action of the employees in calling a strike without the slightest notice to the department. In consequence of the action of the tramwaymen, the Sunday tramway service, which starts at noon, was delayed for nearly three hours, to the serious inconvenience of the public.

On Friday, May 2, Sir William Clegg, chairman of the Tramways Committee, and Mr. A. R. Fearnley, general manager of the tramways department, were waited upon by a deputation from the Amalgamated Association of Tramway and Vehicle Workers, consisting of Mr. N. Bradwell, assistant general secretary, Manchester, Mr A. Clark, president of the Sheffield branch, Mr. E. Smith, member of Sheffield branch committee, and Mr. F. Thraves, local secretary. The whole position was discussed at length, and certain agreements were reached which the deputation undertook to recommend to the men for acceptance. A reasonable spirit governed the negotiations, with the result that a critical situation was relieved.

On Sunday, May 4, a mass meeting of Sheffield tramway workers, held in the Tivoli Theatre, ratified the terms of settlement. To facilitate attendance at the meeting, and enable the men to reach their posts of duty when the meeting was over, the Corporation allowed a number of cars to be requisitioned for the purpose. Marked "Private," and driven by volunteers, these cars were of the greatest service, and the men appreciated the friendly spirit thus brought into evidence.

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MANCHESTER TRAMWAYS ESTIMATES.

The general manager of Manchester Corporation Tramways (Mr. J. M. McElroy) has submitted his annual estimates for the year ended March 31, 1920. From the details given below it will be seen that the traffic revenue is estimated at £1,480,000, and miscellaneous revenue (including motor omnibuses and parcels traffic) £9,800, making a total of £1,489,800, an increase of £120,549 on last year's figures. The expenditure is estimated at £1,377,910. Allowing £90,000 for the renewals fund, the estimated balance is £111,890, which may be allocated to the City Fund in aid of the rates. The detailed estimates and the general manager's notes upon them are appended.

ESTIMATED REVENUE ACCOUNT FOR YEAR ENDED MARCH 31, 1919.

Year ended 31st March, 1919		EXPENDITURE.	Estimate 1919-20
Estimate.	Approximate Expenditure		
£	£		£
277,500	296,345	1 Traffic expenses	598,270
87,000	98,483	2 General expenses	118,180
108,750	133,475	3 Repairs and maintenance ...	188,930
148,500	154,763	4 Power expenses	176,340
304,620	288,053	5 War service allowances, bonuses, etc.	a15,000
49,400	47,791	6 Interest on loans, etc. ...	47,140
28,220	27,687	7 Rent, etc., of tramways ...	27,700
500	469	8 Leaseholds—proportion written off	450
67,203	67,357	9 Sinking Fund and loan instalments	69,400
126,000	109,452	10 Renewals Fund	90,000
6,000	6,224	11 Street improvements—interest, etc.	6,500
20,280	27,687	12 Income-tax	40,000
111,890	111,890	13 City Fund in aid of rates ...	111,890
1,335,863	1,369,676		1,489,800
		INCOME.	
£	£		£
1,318,753	1,359,451	14 Traffic revenue	1,480,000
17,110	10,225	15 Miscellaneous revenue, including motor omnibus and parcels traffic	9,800
1,335,863	1,369,676		1,489,800

(a) War service allowances only. In this year's estimates war bonuses are included in the Operation Accounts.

The estimated expenditure on capital account for new lines and cars is £200,000, and application for borrowing powers has been made for this outlay.

The general manager submitted the following notes on the estimates :—

The estimates prepared at the beginning of the last financial year showed a deficiency in the revenue of £181,753, which had to be met by the adoption of an increased scale of fares. The increased scale of fares was put into operation about the middle of the year, and the total revenue reached £1,359,451, an increase of £251,287 on the previous year's revenue.

The net result of last year's working shows that after making provision for the payment of £111,890 to the City Fund (being 5 per cent. on the capital expenditure—the percentage fixed by the Council), the sum of £109,452 was placed to the renewals account.

The estimates for the present year show that after making provision for the payment of £111,890 to the City Fund, a sum of £90,000 will be available for the Renewals Fund. The estimated traffic revenue is £1,480,000, an increase of £120,549 on last year's figure. This increase must be regarded as a somewhat optimistic estimate, but if it is not realised the committee may have again to consider the question of a further increase in the fares to meet the extraordinary growth in the expenditure.

On the expenditure side it will be noticed that the war bonuses have now been merged in the operating accounts. In these accounts is also included the estimated cost (£70,000) of granting the 48-hour week and other concessions included in the recent national agreement with the Transport Workers' Federation. The wages (including bonuses) now being paid by the department on revenue account show an increase of about £400,000 per annum when compared with pre-war years, the increase being about 117 per cent.

The renewals fund now stands as follows :—

	£	s.	d.
Amount at March 31, 1918	364,150	0	0
Add for year 1918-19	109,452	0	0
	473,602	0	0
Less expended during the past year ...	44,151	0	0
	429,451	0	0

The capital expenditure at March 31, 1919, was £2,237,827, and the outstanding debt, £1,458,814.

The following figures show the growth of revenue and the passengers carried during the past few years.

Year ending March 31.	Revenue.	Passengers carried.
	£	
1915	887,763 ...	202,768,420
1916	925,301 ...	209,877,667
1917	965,829 ...	219,151,984
1918	1,108,164 ...	240,914,369
1919	1,359,451 ...	253,930,220

NEWCASTLE TRAMWAYS.

The annual report of Mr. Ernest Hatton, engineer and general manager, shows that both the income and expenditure of the Newcastle Corporation Tramways have again considerably increased. Alluding to the continued tendency for increases in expenditure, Mr. Hatton says that the undertaking is about to pass through the most difficult period of its existence, inasmuch as the income cannot go on increasing at the rate it has done during the last few years, and there is little prospect of the expenses decreasing except under certain headings. Consequently, with the alterations which are taking place daily, some revision of fares must be considered. The comparative figures show the traffic revenue in 1917-18 to have been £409,114 5s. 1d., as against £346,334 4s. 3d. in 1916-17. Other revenue was £8,914 6s. 7d., against £10,200 12s. 4d., making a total of £418,028 11s. 8d., as compared with £356,534 16s. 7d. The working expenses increased from £203,399 0s. 11d. to £248,394 2s. 3d. the balance (gross profit) on the year being £169,634 0s. 5d., as compared with £148,235 15s. 8d. Adding to this the interest on investment, there was a sum available of £176,512 11s. 5d., against £154,619 0s. 11d. in 1916-17. Among the charges met out of this was a sum of £16,830 15s. 10d. for dependents of men on service, and there was a final balance of £90,785 17s. 3d., as against £62,902 17s. 5d. This was appropriated by income-tax, contribution to rates (£14,000 against £7,000), insurance reserve and renewals fund, in which there was a balance of £155,251 1s. 2d. The following items in the statistical information are of interest :—

	1917.	1918.
Car-miles run	5,833,800	5,971,329
Passengers carried	78,189,246	91,648,545
Passengers carried per car-mile ...	13·41	15·35
Traffic revenue per car-mile	14·53d.	16·82d.
Average fare per passenger	1·084d.	1·095d.
Cost per passenger	0·639d.	0·650d.

RESULTS OF INCREASED FARES AT BRADFORD.

An interim report on the result of last year's operations on Bradford Corporation Tramways, just issued, goes some length towards justifying the contention that raised fares will have the effect of improving the financial outlook of tramway undertakings. For the 364 days covered by the report, there were 7,709,703 fewer passengers than in 360 days of the previous year, and yet there was a net increase in receipts of £92,075. This increase is wholly due to the higher fares, as may be seen from the following table :—

		Increase.
Traffic receipts	£451,877 ...	£89,964
Railless vehicle receipts ...	15,122 ...	2,873
Miscellaneous	5,491 ...	394
Parcels	11,974 ...	—
Total	£484,464 ...	£93,231
Decrease in parcels		£1,156
Net increase ...		£92,075

The actual number of passengers carried was 76,419,459, as against 84,129,252. The car-miles run were 5,269,834, and the receipts per car-mile were 22·06d., an increase of 6·12d. The total number of units consumed for traction purposes was 11,027,312, a decrease of 1,372,202.

STANDARDS FOR ELECTRICITY MEASUREMENT.

The Board of Trade announce that the coils and instruments referred to in the schedule to the Order in Council of January 10, 1910, which approved the several denominations of standards set out in that schedule as denominations of standards for the measurement of electricity will on and after May 8, 1919, be deposited at the National Physical Laboratory, Teddington, Middlesex, instead of at the Board of Trade Standardising Laboratory, 8, Richmond Terrace, Whitehall, London.

All communications respecting electrical standards and instruments for test should be sent to the Director of the National Physical Laboratory, Teddington, Middlesex.

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FINANCIAL REPORTS AND MEETINGS.

MELBOURNE TRAMWAYS AND OMNIBUS COMPANY.—A dividend of 1s. per share is announced.

THERMIT, LIMITED, are supplying material for 600 Thermit-welded joints to Bradford Tramways Committee.

THE BRIDGEPORT BRASS COMPANY has an order for phono-electric trolley wire from Glasgow Tramways department.

HADFIELDS LIMITED, have received orders from Hull and Dover Corporation Tramways Committees for points and crossings.

POTTERIES ELECTRIC TRACTION COMPANY, LIMITED.—A dividend is announced of 5 per cent. per annum on the ordinary shares.

TYNEMOUTH AND DISTRICT ELECTRIC TRACTION COMPANY.—A dividend is announced on the ordinary shares at 8 per cent., £1,000 is carried to reserve, and £1,940 forward.

WALTER SCOTT, LIMITED, are supplying 800 tons of high silicon steel rails to Bradford Corporation Tramways at £18 12s. 6d. per ton; 150 tons are to be treated by the Sandberg sorbitic steel process.

EDISON ACCUMULATOR COMPANY, LIMITED, are supplying three electric vehicles at £1,304 each to Taunton Town Council. One vehicle will be provided with an interchangeable body at an extra cost of £300.

W. T. HENLEY'S TELEGRAPH WORKS COMPANY.—A final dividend is announced on the ordinary shares at the rate of 2s. 6d. per share, less income-tax, making, with the interim dividend of 6d. per share, 3s. per share for the year.

BOMBAY ELECTRIC SUPPLY AND TRAMWAYS COMPANY.—The directors recommend a dividend on the ordinary shares at the rate of 14 per cent. for half-year ended December 31, together with a bonus of 2 per cent. for the year.

LANARKSHIRE TRAMWAYS COMPANY.—A dividend of 11s. per share is announced for the second half of 1918. For the first half the company paid 7 per cent., and the total distribution for the year is thus 9 per cent. Due provision has been made for upkeep and depreciation.

PLYMOUTH CORPORATION TRAMWAYS.—The annual financial statement shows that the total income amounted to £121,047, of which £33,024 was gross profit. After payment of capital charges, etc., the net surplus is £10,679. Of this amount £6,000 is to be appropriated for working capital, and the balance of £4,679 carried to the reserve fund.

NORTHERN GENERAL TRANSPORT COMPANY.—After providing £5,189 for renewals, the profit balance is £38,841, as compared with £22,589 a year ago. The dividend on the ordinary shares is raised from 6 per cent. to 8 per cent., £1,584 is carried to the sinking fund for redemption of debenture stock, and the undivided balance is increased from £6,626 to £12,565.

EDINBURGH TRAMWAY ESTIMATES.—Edinburgh Tramways Committee have approved the estimates submitted by the general manager (Mr. R. S. Pilcher) for the period from June 30 this year, when the Corporation takes over the working of the tramways, to May 15 next year. The total expenditure is estimated at £329,225, and the total revenue at £401,855, leaving a balance of £72,630, which will be required for interest and sinking fund contributions.

PORTSMOUTH CORPORATION TRAMWAYS.—The tramway accounts show an income of £121,047, and a gross profit of £33,024. There is a net profit on the undertaking, after payment of all charges, of £10,679. The Tramways Committee have retained £6,000 as a working balance, and have allocated £4,679 to the reserve fund. The number of passengers carried was 28,438,343, against 26,187,549. These figures do not include 43,600 wounded soldiers carried free.

SOUTH SHIELDS BOROUGH TRAMWAYS.—The report for the year 1918, presented by Mr. J. C. Whiteley, manager of South Shields County Borough Tramways, shows a total revenue of £51,726, an increase of £7,288 over 1917. Working expenditure is £38,726, an increase of £3,040, but the total includes £5,344 reserved for repairs to permanent way, overhead equipment and rolling stock. After paying interest on capital, etc., £5,864, and contribution to sinking fund, and various repayments, amounting in all to £4,198, there remains a balance of £4,350, which is to be given in aid of rates.

TYNEMOUTH AND DISTRICT ELECTRIC TRACTION COMPANY.—The report for the year ended December 31 last shows that the total revenue for the year amounted to £25,552, an increase of £4,263 over 1917. The expenditure, including a provision of £2,067 for renewals, was £17,985, an increase of £6,512 as compared with the previous year. The surplus on the year's working is £7,566, making with £612 brought forward from the previous year a total of £8,177. The amount is to be appropriated as follows:—To reserve, £1,000; to 5 per cent. dividend on the preference shares, £1,525; to 8 per cent. dividend on the ordinary shares, £3,712; to next account, £1,940.

RHONDDA TRAMWAYS.—The gross revenue of the Rhondda Tramways increased from £82,225 to £98,862 for the year 1918, and the number of passengers carried rose from 12,865,806 to 13,926,707. Operating costs fell from 77·14 per cent. to 73·09 per cent. There is an available balance of £34,733. Deducting rent paid to the Rhondda Council, depreciation, debenture interest, and reserves, the balance is £17,044. The directors propose to add £10,000 to the reserve for renewals, bringing it up to £36,000, and to pay a dividend of 6 per cent. on the preference shares, 4 per cent. being the balance on account of 1913, and 2 per cent. on account of 1914, carrying forward £1,044.

LONDON UNITED TRAMWAYS.—On Tuesday, April 8, Mr. Justice Astbury sanctioned the scheme of arrangement and reduction of capital of the London United Tramways. Counsel stated that, after prolonged negotiations with local authorities, an Act of Parliament was obtained in 1918, whereby the times at which local authorities could compulsorily purchase was put into one date, namely, 1950, and the company was allowed to charge somewhat higher fares. By the reconstruction scheme, accepted by share and debenture holders, and now sanctioned by the Court, it is proposed to reduce the share capital from £2,500,000 to £656,250, divided into 125,000 preference shares of £5 5s. each, which were to be sub-divided into 21 fully-paid shares of 5s. each, and each preference share was to be converted into one ordinary share of 5s. The capital was thereafter to be increased to £1,619,250 by the creation and issue of 963,000 new £1 preference shares.

W. T. HENLEY'S TELEGRAPH WORKS COMPANY.—The report of last year shows a gross profit of £203,410. After deducting debenture interest and other items, and the amount written off for depreciation and repairs, and adding the amount brought forward (112,041), there is a total balance of £260,095. Allowing for income-tax, reserve account, dividend on preference shares, and interim dividend on ordinary shares, there is an available balance of £179,509. A final dividend of 2s. 6d. per share on the ordinary shares, less income-tax, making 3s. for the year, has been declared, and £7,500 is carried to the staff pension fund, leaving £122,009 to be carried forward. At the meeting Mr. George Sutton (chairman) said that the accounts dealt with trading during a year of war. After November 11 they closed as rapidly as possible the work which they were doing for the war, but they have been hampered in the execution of peace orders by the difficulties in procuring raw material, and by insufficiency of labour. While they were proposing a 15 per cent. dividend, it was less than 4½ per cent. on the actual capital employed in the business. He had sometimes thought that they might be withholding too great a proportion of the profits earned, but the security of capital had been their first object.

INCREASED FARES IN LONDON.

On Sunday, April 27, the higher scale of fares came into operation on all the London County Council tramway routes south of the Thames. About forty different services are involved, radiating from the four principal termini—Victoria, Westminster, Blackfriars, and Southwark Bridge—to most of the outlying suburbs south of the city. At present the general effect of the new charge has been to add a penny to each fare. All journeys beyond 1·5 miles, which formerly cost one penny, now cost twopence, the twopenny ride is threepence, and the passenger accustomed to paying threepence now finds he must pay out fourpence. It can be easily understood that the alteration has not been accepted without serious and widespread complaint. The penny stages are not reduced by half—in fact, the reduction amounts to less than a fourth; but the point at which each stage ends has been fixed with greater regard to distance than to popular topography. Nearly all the passengers, and even a few conductors, will take some time to find their bearings again. Meanwhile, the decline in the number of passengers is very marked. Probably this is partly the effect of resentment and partly determination on the side of the public to demonstrate the futility of the higher fares policy. After a few weeks numbers will no doubt resume travel by car, and the strangeness of the position will wear off. Judgment therefore on the L.C.C. policy must be suspended for a period.

OMNIBUS FARES.

Mr. Higham asked the Home Secretary in the House of Commons on May 7 if he had commenced his inquiry into the reason for the increased omnibus fares in London. Mr. Shortt replied that he had obtained full details from the London General Omnibus Company, and he proposed to submit them to an eminent accountant to report on the question whether the increase in fares was justified.

Relaying Tramway Rails in Aberdeen.—Dean of Guild Meff, convener of the Tramways Committee of Aberdeen Town Council, brought before a recent meeting of the committee the urgent necessity for relaying the tramway track between Union Bridge and Castle Street. This work, the convener explained, would give employment to a considerable number of men, as it would have to be expeditiously carried out. The matter was remitted to the burgh surveyor and the tramway manager, to bring up a report at the earliest possible date, with an estimate of the cost of the work.

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CONTRACTS AND ORDERS.

The J. G. Brill Company have received an order from Glasgow Tramways Committee for truck frames.

Reading Tramways Committee have recommended the purchase of five motor omnibuses, at an estimated cost of £7,750.

St. Helens Electricity Committee has accepted a tender for cable from the British Insulated and Helsby Cables Limited.

The British Thomson-Houston Company's tender for six electric cars at £10,308 has been accepted by the East Ham Tramway Committee.

The British Automobile Traction Company are to supply a motor chassis for a rail welding machine and tramway tower wagon for Reading Corporation.

Dick, Kerr and Company, Limited, are to supply ten new vestibule tramway cars, with equipments, at a price of £1,792 per car, exclusive of the truck, to Doncaster Corporation.

Edison Accumulators, Limited.—The tender of this company for a 3½-ton electrically-driven vehicle has been recommended for acceptance by a committee of the Luton Council.

G. P. Trentham, Limited, of Birmingham, have a contract with the East Ham Town Council for the reconstruction of permanent way to the value of £25,099, and for paving and concrete foundations for road margins at £18,222.

Bradford Corporation have accepted the following tenders:—Rails, Walter Scott, Limited; tie-bars, Bayliss, Jones and Bayliss, Limited; rail bonds, British Insulated and Helsby Cables, Limited; welded rings, clips, bolts and nuts, E. Longbottom; and round steel rods, Crossley and Davenport.

Glasgow Tramways Committee have accepted the following among other tenders: Axles, Glasgow Railway Engineering Company, Limited; galvanised steel wire, Whitecross Company, Limited, Sir J. Stewart and Company, Limited; commutators, P. R. Jackson and Company; drop forgings for jacks, A. Harper, Sons and Bean, Limited.

John I. Thornycroft and Company, Limited, have received an order for six of their type "J" motor chassis from Southampton Corporation Tramways. Among a large number of other orders now being executed by the same firm for their type "J" chassis for public service vehicles are the following:—Six for the Great North of Scotland Railway, six for the Great Eastern Railway, eleven for the various branches of the Provincial Tramways Company, and ten for the Portsmouth Corporation, the latter to be fitted with double-deck omnibus bodies. Another order is from the British Automobile Traction Company, who have already purchased a large number of Thornycroft's type "J" chars-a-bancs chassis. With the exception of the orders from Southampton and Portsmouth, all the above are repeat orders.

The English Electric Company—in which, it will be remembered, are now consolidated the various interests of the Coventry Ordnance, Dick, Kerr, Phœnix Dynamo, United Electric Car, and Willans and Robinson Companies—has secured an order from the Huddersfield Corporation for a 5,000 KW. turbo-alternator set, speed 3,000 revolutions per minute; and another from the Nottingham Corporation for a similar turbo-alternator set of 3,000 KW. output, together with surface condensing plant and cooling tower. The latter contract also includes the supply of rotary converters and an equipment of Ferguson super-heaters to existing Lancashire boilers to secure economies in steam consumption with the new turbine. This plant will be installed in the two Nottingham power-stations, together with interconnecting E.H.T. switchgear and transformers.

SANDBERG'S "IN-SITU" TREATMENT OF TRAMWAY RAILS.

In the issue of THE TRAMWAY AND RAILWAY WORLD of April 11, 1918, a description was given of Messrs. Sandberg's patent process for hardening existing tramway rails in position without disturbing the rails or pavement.

At that date, with the exception of experiments on a small scale at Leeds, the only contract secured was on the Croydon Corporation Tramways. At the present time Messrs. Scholey and Company, Limited, 56, Victoria Street, Westminster, the licensees and contractors for the patent, inform us that they have contracts with the following tramways:—Birmingham, Liverpool, Croydon, Manchester, Glasgow, Bournemouth, and the Metropolitan (London). Repeat orders have been obtained from the Corporations of Manchester, Birmingham, and Croydon, and negotiations are being completed with a number of other undertakings.

We understand that the results obtained so far are most encouraging, and that there is definite proof that the treatment is successful in retarding, if not actually preventing, the development of corrugation.

The process has been introduced at a most opportune time, and apart from the increased resistance to wear, the mitigation of the corrugation trouble, and the prevention of battering at joints are considerations which appear fully to justify the cost of the treatment.

PERSONAL.

Mr. E. B. Wedmore has been appointed as Director of Research by the Electrical Research Committee.

Mr. John Moulds has been appointed assistant to the electrical engineer of Leicester, at a salary of £500 per annum.

Mr. A. S. Blackburn, electrical engineer of Sunderland Corporation, has been granted an increase in salary of £200, to £1,200.

Mr. Thomas Roles, city electrical engineer of Bradford, has been granted an increase in salary of £250, to £1,250 per annum.

Mr. H. E. Stilgoe, city engineer and surveyor of Birmingham, has been appointed engineer to the Metropolitan Water Board.

Mr. H. E. Ellis, borough electrical engineer of South Shields, has been appointed chief electrical engineer of Southampton Corporation.

Mr. A. T. Kellet has been appointed assistant permanent way engineer of Sheffield Corporation Tramways, at a salary of £400 per annum.

Sir John Aspinall, ex-general manager of the Lancashire and Yorkshire Railway, has joined the Board of the English Electric Company, Limited.

Mr. W. T. Robson, tramways manager and engineer of Southampton Corporation, has been granted an increase in salary from £500 to £700 a year.

Mr. W. J. Squires has been appointed chairman, and **Lieutenent-Commander A. Cooper Rawson** vice-chairman of the Highways Committee of the London County Council.

Mr. R. Q. Robertson has been appointed manager of White Motors and Accessories, Limited, in succession to Mr. W. J. M. Bell, who has severed his connection with the company.

Mr. W. A. Jones has resigned the position of charge engineer of Leyton Council on his acceptance of the post of general secretary of the Electrical Power Engineers' Association.

The many friends of **Mr. J. M. McElroy,** general manager of the Manchester Corporation Tramways, will be glad to learn that he has recovered from his recent illness, and has resumed his usual duties.

Mr. E. W. Sleight has resumed his duties as manager of the Carlisle Tramways Company, on returning from the army. He served in the Royal Fusiliers and King's Own Lancashire Regiment, and was severely wounded.

Mr. William Morris, of Messrs. Ashurst, Morris, Crisp and Company, has been appointed a director of the Anglo-Argentine Tramways Company, Limited, and **Mr. W. D. Dawes** has been appointed London manager and secretary.

Sir Auckland Geddes, Minister of National Service and Reconstruction, has resigned in order to accept the presidency of McGill University, Montreal, where he was Professor of Astronomy previous to the outbreak of war. He will, however, remain in this country until the autumn.

Mr. J. A. Raworth has been joined in partnership by Mr. Ernest W. Moss, who was for some years chief assistant to the late Dr. S. P. Thompson. He was also assistant to Mr. H. M. Hobart. The new firm will be called Messrs. J. A. Raworth and Moss, with head offices at Queen Anne's Chambers, S.W.

Mr. A. R. Fearnley, general manager of the Sheffield Corporation Tramways and motor department, has been retained by the Middlesbrough, Stockton and Thornaby Corporations to advise and give evidence in the negotiations and purchase of the Middlesbrough, Stockton and Thornaby Tramways by the three Corporations. The tramways are owned by the Imperial Tramways Company.

Mr. E. T. Brandon, electrical engineer of the Hydro-Electric Power Commission of Ontario, and **Mr. E. Buchanan,** local manager of the system at London, Ontario, are about to visit this country to interview British manufacturers, to study their methods, to let them know just what class of electrical material is required in Ontario, and to ascertain to what extent the manufacturers are prepared to compete in that province.

Sir Albert Stanley, President of the Board of Trade, in accordance with the doctor's orders, is not at present dealing with his official duties. In these circumstances Sir Auckland Geddes has undertaken the function of Acting President of the Board of Trade during Sir Albert Stanley's illness. The "Board of Trade Journal" recently stated that there is every hope and expectation that Sir Albert will shortly be fully restored to health and able to resume his duties as President of the Board of Trade, but it is reported that Sir Albert desires to retire from the House of Commons at the end of this session.

We regret to record the death of **Mr. W. E. Blake,** superintendent of the line of the Underground Electric Railways, which occurred on May 8 at St. George's Hospital, after an operation. Some weeks ago Mr. Blake, while directing the removal of a derailed car, fell and received a slight injury to his leg. Septic poisoning resulted, and it was necessary to amputate his leg. Mr. Blake, who was 55 years of age, went to the District Railway as a boy of 16. He had seen the traffic increase from 16 trains an hour in the old steam days to over 50.

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TRAMWAY AND LIGHT RAILWAY NOTES.

ABERDEEN.

MORE CARS REQUIRED.

At present Aberdeen Corporation Tramways department has 82 tramway cars, but the management has decided that, to provide for increased traffic and to meet emergencies, at least 100 cars are required. With characteristic caution, the Tramways Committee has authorised the construction of two cars only, in the hope that prices will fall while these are being built. Before 1914 a car could be produced for £800, and at present the cost is £2,400. For some time past the new cars required by the Corporation have been built in Aberdeen.

BARROW.

COMPANY EXTENDS OPTION TO PURCHASE THE TRAMWAYS.

At the recent meeting of Barrow Town Council, the question of purchasing the tramways undertaking which serves the town from the British Electric Traction Company, the present owners, was brought up. The option to purchase expired on April 10, but the company had agreed to extend the period of option for three months.

BELFAST.

CARS DAMAGED BY PASSENGERS.

At Belfast on April 14 three tramway cars bound for the shipyards were rushed by about three hundred people, who filled the cars to such an extent that they could not be moved. The crowd resented attempts to reduce the crowding, and the windows and woodwork of the cars were smashed. One of the cars containing about seventy men was finally started, and when it reached Musgrave Street Barracks it was surrounded by police. The men were removed and their names taken. Many protested that having boarded the car they were unable to leave it, and had nothing to do with the damage. The trouble appears to have arisen from passengers waiting for the last possible cars, as the tramway officials stated that many earlier cars left only partially filled.

BLACKPOOL.

PURCHASE OF BLACKPOOL AND FLEETWOOD TRAMWAYS.

The Corporation of Blackpool and the Fleetwood Council have agreed upon terms which will enable Fleetwood to exercise its option to purchase the portion of the Blackpool and Fleetwood tramroad in its district within a certain number of years. In the meantime Blackpool Corporation will acquire the whole undertaking and work it in connection with their system, thus giving a through route to Fleetwood.

BRADFORD.

NEW MOTORS ORDERED.

Bradford Tramways Committee propose to order 52 tramcar motors in addition to the 52 recently ordered.

BRISTOL.

OVERCROWDING IN CARS.

Bristol Health Committee, at a meeting on April 15, discussed the report of the Medical Officer of Health, advising that, as the death rate was becoming normal, the restrictions on public performances and overcrowding in tramcars should now be taken off. The committee agreed, however, that overcrowding in the cars was dangerous to health, and decided that the Town Clerk should draft a letter to the Watch Committee in that sense.

CARDIFF.

IMPROVEMENT IN SERVICE.

Step by step Cardiff tramway services are being brought back to pre-war efficiency. A short time ago improvements were made in the services, and since then additional cars have been put on to the routes to the centre of the city both early morning and late evening. Services now start at 5.10 a.m., from various outlying termini, with additional cars, and the running continues up to 11 p.m. Stopping places in abeyance during the war have now been restored.

CARLISLE.

CAR LICENCES RENEWED.

The Carlisle Watch Committee recently limited the tramway car licences to a period of three months, in order to see how certain improvements promised by the company progressed. The period expired at the end of the present month, and the General Purposes Committee, at a meeting on April 10, reported that the company were doing their utmost to improve the condition of the tramways. The Watch Committee accordingly agreed to continue the licences for a further period.

CROYDON.

WOMEN CONDUCTORS RELEASED.

Women conductors have now been all replaced by men on the Croydon Corporation Tramways.

EDINBURGH.

OVERHEAD TROLLEY SYSTEM ADOPTED, PRINCES STREET EXCEPTED —MOTOR OMNIBUSES TO BE PURCHASED.

The question whether the conduit system or the overhead trolley system shall be installed in Princes Street is a question which has been keenly debated in Edinburgh. Opinion among the deputation which visited London and Bournemouth recently was divided between the two systems. Mr. Pilcher, the general manager, in the meantime drew up another report on the question of the system of traction for Princes Street, and in this he reiterated his objections to the conduit system. He pointed out that the cost of providing pointsmen at the several junction points in Princes Street would be not less than £800 per annum, and he emphasised the greater risk of breakdowns owing to the climatic conditions than with the overhead system. The sub-committee of the Tramways Committee drew up a report, non-committal in character, making no definite recommendations, but on April 9, when the matter was discussed by the Council, the following recommendations for the future arrangements and reconstruction of the tramway system of Edinburgh were approved :—" That the overhead electric system should be adopted generally, subject to separate consideration being given to special parts of the city ; that Princes Street should be separately considered ; that preparations for conversion and reconstruction should be made at once ; that conversion and reconstruction should be carried out in sections, the first to be undertaken being the section from Pilrig to Liberton ; that tentative approval should be given to the extensions recommended in the tramway manager's report ; and that a number of motor omnibuses, not exceeding 15, should be acquired. As the tramway system passes into the hands of the Corporation on July 1, the present employees are anxious to know the conditions under which they will be taken over by the Corporation. The men have already resolved that they must be dealt with through their union and not individually.

GLASGOW.

TRAMCARS FOR REVELLERS—WOMEN DRIVERS RELEASED—EMPLOYEES ON COMMITTEES.

Early in the year a "Victory" Ball was held in Glasgow in aid of " Jock's Box," and the management had the enterprise to provide tramcars to take the dancers home in the early hours of the morning. The great convenience of the expedient having thus become evident, it is now quite the thing for organisations holding high revel till far on in the night to charter tramcars to carry their guests homeward. Promoters of pic-nic parties have also realised the value of the tramcars as conveyances, and the bookings for that purpose are reported to be numerous. Saturday pic-nics by tram would be immensely popular, but at present the adventure is quite impossible. Between 3,000 and 4,000 of the employees of the Glasgow Corporation Tramways have served with the forces during the war. Recently men have been demobilised at the rate of abour 50 weekly, and to reinstate these men in their former situations women were released on April 12 from the duties of motor drivers, and have taken up those of conductors. The women more recently added to the staff have been dismissed, but there are still a large number of women in the tramway service. Glasgow was the first tramway to employ women as drivers. Bailie Wheatley, a Labour member of Glasgow Town Council, has tabled a motion requiring that each standing committee of the Council shall include a number of members to be elected annually by the employees of the department controlled by that committee, such members to form at least one-third of the whole, and to have equal powers with the other members.

HALIFAX.

TRACK RELAYING AND THE PRICE OF RAILS.

Halifax Tramways Committee have received a letter from the Ministry of Labour stating that, having regard to the already serious state of unemployment in Halifax and district, and the prospect of a further increase as demobilisation proceeds, the Divisional Council for Demobilisation and Resettlement strongly urges the necessity of putting in hand public works with a view to absorbing unemployed labour. The committee passed the following resolution :—" That while this committee is desirous of carrying out forthwith the work of relaying the tramway track, the attention of the Municipal Tramways Association be called to the high price of rails and materials with a view to the appropriate Government Department being asked to fix a reasonable maximum price in connection therewith."

HULL.

REINSTATEMENT OF EX-SERVICE MEN.

At the meeting of Hull City Council, on April 3, Councillor Richardson proposed :—" That in the case of Corporation employees who on demobilisation are found to be physically unfit for the work previously performed by them, it be an instruction to heads of departments that work shall be found for these men which they are capable of performing either in the department previously employing them or by consultation with heads of other departments. That such employment shall be so arranged that the total of the men's wages, plus any disability pensions, shall not be less than the current wages for the work he was on prior to enlistment, and that it be an instruction to heads of departments to report any cases when they are not able to carry out the terms of the foregoing to the committee concerned as speedily as possible."

LIVERPOOL.

COMMITTEE TO VISIT AMERICA—NEW ROLLING STOCK—TRAMWAY TO BE PURCHASED BY CORPORATION.

The Liverpool Tramways and Electric Lighting Committee have selected by ballot the following members as a deputation to visit cities in the United States and Canada to study tramway and electric supply improvements :—Alderman Russell Taylor, chairman ;

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Mr. F. C. Wilson, chairman of the Sub-Extension Electrical Committee; Mr. W. A. Robinson, leader of the Labour Party in the Council; and Mr. David Jackson. Two members are to be added from the Health Committee. The deputation will be accompanied by Mr. J. A. Brodie, city engineer, Mr. Harold Dickinson, city electrical engineer, Mr. C. W. Mallins, general manager of the tramways, Mr. A. G. Smith, city lighting engineer, together with the committee clerk. Several members of the Tramways Committee have expressed their intention of accompanying the deputation at their own expense. The deputation will leave for New York on May 27. About 25 of the 100 new cars recently ordered will be delivered shortly, and the committee hope by midsummer greatly to improve the service. At a meeting of Liverpool City Council, on April 2, it was resolved to promote an Order under the Light Railways Act to purchase from the Lancashire Light Railways Company a length of three and a half miles of tramway between Knotty Ash and Prescot. The agreed price, according to Alderman Russell Taylor, was £18,000, but renewal of the track would cost from £27,000 to £30,000.

LONDON.

A Van Driver's Negligence.

Judgment was given in favour of the London County Council Tramways in the Clerkenwell County Court on April 7 in an action for damages for personal injuries sustained by a passenger who was thrown violently against a seat owing to the car stopping suddenly with a jerk. The judge held that the driver of the car was not guilty of negligence, as he had stopped the car to avoid a collision. He gave judgment against Messrs. Bushnell and Sons, carmen and contractors, against whom an action was also brought, ruling that the injuries were received by the negligence of their van driver.

NEWCASTLE.

Special Service at Special Fares—Appreciation of Employees' War Work.

Newcastle Tramways Committee have made arrangements to run special cars to meet the 11.30 p.m. train arriving from London. A special charge is made on these cars. To a deputation from the Newcastle Trades Council, asking for a better service of workmen's cars, the general manager pointed out that greater facilities could be provided but for the fact that the alteration of the hours in the factories brought them so close to the hours for ordinary traffic. The Tramways Committee propose to entertain the auxiliary tramway workers at a social gathering, in order that the committee may express their appreciation of the work done by these men during the war.

SHEFFIELD.

Music in the Parks—A Tax on Passengers.

Sheffield Tramways Committee propose to contribute £200 towards the cost of music in the parks. The *Sheffield Daily Telegraph* remarks that it has no great liking for these tramway contributions. They are useful when there is a doubt as to the legality of paying for anything from the rates, but it should be quite possible to pay for music in the parks as part of the ordinary maintenance charges. If that is not so, then the tramway's contribution will come in useful. If it is so, then it would be very much better that the cost of music in the parks came directly from the rates. It certainly is not just that tramway passengers should be taxed for luxuries.

STOKE-ON-TRENT.

Vestibules Wanted on Tramcars.

At a meeting of the Estates, Public Works, and Tramways Committee of Stoke-on-Trent Borough Council, the Town Clerk submitted a resolution of the N.S. Trades and Labour Council, calling upon the Potteries Electric Traction Company to provide vestibules on all cars on their services, and asking for the Council's support. The committee resolved to support the action of the Trades and Labour Council, and urged the company to provide such vestibules at the earliest possible moment.

WALLASEY.

New Cars to be Ordered—Motor Omnibuses Later.

Wallasey Tramways Committee are arranging for the purchase of ten new cars at a cost of £20,600, but they have postponed a decision of the question of obtaining motor omnibuses for six months. The Council hope they may then be able to obtain the vehicles at a lower price.

WEMYSS BAY.

Tramway Extensions Proposed.

A scheme is being discussed for linking up Wemyss Bay and Largs by an electric tramway. The distance is about ten miles, and as the roadway is practically level throughout, the route is well adapted to tramway construction.

WORCESTER.

Tramway Conductor's Responsibility.

At an inquest on a man of 74, who jumped off an omnibus before it had stopped, and was killed by being struck by a motor car, the coroner for North Worcestershire said that no blame attached to anyone, but the conductor ought to exercise discretion in looking after passengers. The conductor, in his evidence, had said that they were not supposed to hold back people if they wished to jump off. One of the officials said that they encouraged their conductors to caution any member of the public who might stand on the platform not to attempt to jump off before the vehicle came to a standstill. At the same time, they could hardly forcibly restrain any passenger who might wish to take the risk in jumping off. If they did so, they might be summoned for assault. If passengers deliberately disregarded warnings, they must take the consequences.

YORK.

Tramways Committee to Join National Industrial Council—Wages Raised.

After considering the constitution of the National Joint Council of the Tramway Industry (the text of which was published in our issue of March 13), York Corporation Tramways Committee has agreed to become a member of the Council. At a recent meeting of the Committee, the tramways manager, Mr. J. W. Hame, reported the result of negotiations with the tramway employees on the question of wages and hours of work. The committee have agreed to pay the employees a war wage of 30s. per week to a man who has worked his full six days or six shifts on rota duty, and an extra 5s. when he is required to work a shift on the seventh day, overtime to be paid on a certain hourly basis.

PATENT LIST.

Abstracted for "The Tramway and Railway World" from the Official Journal of Patents.

***** If the inventions have been communicated the names of the communicators are given in italics.**

Applications for Letters Patent.

The number of the patent is given in brackets.

Multiple control apparatus for electric railways with motor-driven main switch drums (8,200)—Akt.-Ges. Brown Boveri et Cie.
Self-propelled tramway and railway cars (8,368)—G. Ashton.
Rail joints (8,191)—H. V. Baints.
Mechanically-propelled vehicles (8,037)—E. W. Bonson.
Transmission gearing for power-driven vehicles (8,351)—E. W. Bowen and T. L. Davies.
Device for oiling and greasing motor vehicle road springs (8,088)—H. Capel.
Motor cars (8,071)—C. Contal.
Petrol tank for motor cars (8,588)—J. S. Haigh.
Brake actuated mechanism for tramway cars (8,122)—W. Heap.
Omnibus construction (8,625)—W. J. Hickman.
Steering and front wheel brakes of automobiles (7,995)—L. A. Higginbottom.
Radiators for motor vehicles (8,615)—M. F. Huxley.
Driving devices of motor vehicles (8,538)—O. Imray (*M. Walter*).
Locking device for motor vehicles (8,317)—H. Jenks.
Device for driving motor vehicles (8,372)—J. W. McKay.
Motor vehicle bodies (8,187)—G. Maddox.
Device to enable motor cars with broken rear axle to be driven on their own power (8,646)—G. S. Owen.
Station indicators for passenger vehicles (8,345)—E. Petitjean.
Resilient tires for motor vehicles (8,045)—A. M. Robinson.
Automobiles (8,192)—E. J. Y. Rutherford.
Change speed gearing (8,308)—A. B. Sanders.
Semi-solid resilient rubber tire for motor vehicles (8,614)—A. Tomlins.
Lines for light railways (8,232)—A. D. Watts and L. P. Watts.
Power Transmission mechanism of railway motor cars (8,718)—Baguley Cars, Limited, and E. E. Baguley.
Mechanically propelled vehicles (9,277)—L. Barrow, Cadbury Brothers and S. M. Scott.
Device for tramcar trolley poles (9,340)—J. H. Beabey.
Differential gear (9,390)—K. A. T. Berg.
Variable speed gear (8,843)—J. M. Carruthers and A. E. Cox.
Lifting jacks (8,957)—J. J. Culver.
Bodywork frames for motor vehicles (8,846)—Daimler Company and H. C. Inskeep.
Omnibuses, etc. (9,377)—C. Dodson.
Variable speed gear (9,286)—E. N. Gulick.
Mounting light steel flat bottomed rails upon steel sleepers (8,680)—S. Hemingway.
Combined pulley wheel and extension pieces for trolley pole of tramcars (8,823)—J. M. Hodges and A. Smith.
Electric signalling apparatus for cars on electric railways (8,877)—C. Kunzli and H. Schaub.
Variable speed gear (9,391)—R. Lindsay.
Locking device for motor vehicles (8,938)—G. E. Palmer.
Direction indicators for motor cars (9,158)—B. C. E. Parker.
Permanent way of railways, etc. (8,745)—E. A. W. Phillips.
Reducing speed gear mechanism (9,097)—A. R. Prentice.
Change speed gears (9,193)—T. A. Rees.
Means for steering and controlling motor vehicles (9,156)—L. Renault.
Safety guard for motor cars (8,724)—M. W. Robinson.
Electric vehicles (8,827)—W. Rogers.

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Electrically propelled vehicles (9,074)—J. Scott.
Friction change speed gears (9,371)—R. J. C. Tampier.
Automatic variable speed gear (8,862)—C. H. Winteringham.
Motor vehicles (9,872)—M. de Arrigunaga.
Speed indicators (9,711)—R. Berry and E. A. Lambert.
Compressed air brake apparatus for railway, etc., vehicles (9,777 and 9,778)—British Air Brake Company and J. W. Cross.
Means for actuating speed indicating devices, governors, etc. (9,486) —G. Constantinesco.
Coupling for trollies, etc. (9,493)—A. Devrin.
Method of attachment and springing of motor vehicle road wheels (9,674)—J. Dixon.
Light motor vehicles (9,606 and 9,607)—H. M. Edmonds.
Motor fore-carriages (9,863)—H. M. Edmonds.
Variable speed gear (9,852)—A. Elverston.
Tires of motor cars (9,706)—G. M. Handyside.
Signalling danger to vehicles at road junctions (9,698)—S. Horton, F. Whitworth and R. Willetts.
Electric signalling and indicating apparatus (9,443)—McKenzie, Holland and Westinghouse Power Signal Company and H. M. Proud.
Appliances for locking steering wheels of motor cars, etc. (9,574)—C. N. Neal.
Pneumatic tires for motor vehicle wheels (9,795)—R. P. Payne.
Change speed gear (9,844)—M. Rose.
Devices for locking motor cars (9,553)—T. A. Waters.
Variable speed gear (10,088)—H. B. Allen.
Hand steering wheels of motor vehicles (10,412)—Bluemel Brothers and F. H. Bluemel.
Motor vehicles (10,263)—R. J. Wainwright-Brown and G. de Holden-Stone.

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Change speed gears for motor vehicles (10,370)—F. Butler.
Device for locking motor vehicles (10,364)—W. E. S. Debenham.
Direction indicator for motor cars (10,384)—A. V. Grenville.
Driving mechanism for motor vehicles (10,383)—H. Singleton-Griesbach.
Regenerative braking system for electrically driven vehicles (10,096) —K. H. O. Lubeck.
Laminated springs of motor cars (10,286)—F. D. Madge.
Motor vehicles (10,354)—L. E. de Mole.
Clutches and variable, etc., speed mechanism (9,916)—T. J. Read and W. J. Read.
Power transmission mechanism for automobiles (9,943)—H. C. Reading.
Suspension of automobile vehicles (10,226)—A. A. Scott.
Mechanism for locking steering wheels and control levers of motor vehicles (10,119)—T. A. Waters.

Specifications Published.

1916.

Motor vehicles (85—*124,450*)—R. F. Macfie.

1917.

Means for utilising the bodies of motor vehicles for the storage of gas (10,256—*123,777*)—W. H. Dunkley.
Solid rubber tires (18,450—*123,789*)—Dunlop Rubber Company and H. C. Young.
Clutches for use on motor vehicles (10,898—*124,226*)—J. E. Holt and W. Harpham.
Motor driven vehicles (19,182—*124,535*)—Portland Engineering and Traction Company, J. Williamson and A. E. Munby.

1918.

Radiators and adjacent fittings of motor vehicles (3,771—*123,809*)—G. F. Cooke.
Driving mechanism for the auxiliaries employed on motor vehicles (4,002—*123,824*)—R. W. Maudslay and Standard Motor Company.
Control for gas driven vehicles (4,021—*123,826*)—South Metropolitan Gas Company and R. C. Macdonald.
Change speed gears (4,193—*114,307*)—J. Klaus-Ott.
Signal devices for motor vehicles (6,327—*116,883*)—Benjamin Electric Company.
Road wheels for self-propelled vehicles (7,453—*123,891*)—C. W. Higgs and A. W. D. Gladwell.
Gas producer for use on motor cars (7,765—*123,894*)—A. E. W. Maseyk.
Differential gear for motor vehicles (17,479—*123,943*)—A. Franks.
Hubs for use with motor vehicles (17,618—*123,945*)—R. J. Treen.
Apparatus for grinding tramway rails (21,361—*123,964*)—W. L. Lorkin.
Boarding tramcars (2,347—*124,011*)—H. A. Hunt.
Variable speed friction device (7,143—*124,097*)—R. Lowe and E. Wainwright.
Variable speed and reversing gearing (14,760—*124,148*)—J. J. Robinson.
Variable speed gear (18,175—*124,159*)—Crossley Motors, Limited, T. D. Wishart and T. N. Harrop.
Arrangement of fuel containers and instrument boards of motor vehicles (622—*119,024*)—E. H. Belden.
Lugs for power plant support for motor vehicles (6,984—*115,833*)—Hudson Motor Specialities Company.
Resilient means for automatically controlling the actuation of variable speed and reversing gearing and application thereto (7,918—*124,323*)—G. Rogers.
Fluid pressure braking apparatus (10,036—*123,709*)—W. V. Turner.
Tramway point operating devices (17,986—*124,391*)—G. Hendriks.
Electrical signalling systems for use on motor road vehicles (18,088—*124,394*)—Naillik Motor Signal Company and J. P. Ogden.
Differential gearing (5,273—*124,563*)—A. T. Nogrady.
Devices for controlling the speed of automobile vehicles (5,437—*116,691*)—A. Gaillard.
Variable speed gears (6,107—*124,602*)—S. A. Bagley and T. Bransom.
Electro-magnetic brakes, etc. (7,164—*124,618*)—E. C. Villiers.

1919.

Reversing gearing (762—*122,634*)—A. A. Fernstedt.
Change speed gearing (4,298—*123,753*)—H. C. Blanc-Garin.

Report on Edinburgh Track.—Preliminary to taking over the tramways from the Edinburgh and District Tramways Company, on June 30, Edinburgh Town Council demanded that the track, which has fallen into disrepair, should be put into working condition. The company took the view that the Council's demands were excessive, and the matter was referred to arbitration. Sir A. B. W. Kennedy, the appointed arbitrator, has now issued his award. He finds that certain portions of the track must be relaid with new rails, and certain other parts with rails partly used.

A Halfpenny Saved on Returns.—The Sheffield Corporation Tramways and Motors Department has made arrangements whereby passengers travelling on the cars up to and including 9 a.m. on weekdays can obtain return tickets for the 1½d. fare stages at a cost of 2¼d., thus effecting a saving of a halfpenny on the double journey.

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TRAFFIC RETURNS.

Tramway and Omnibus Undertakings in the United Kingdom.

NAME OF COMPANY OR CORPORATION.	1918. WEEKS ENDED. Mar. 30	April 6	April 13	April 20	April 27	1919. WEEKS ENDED. Mar. 29	April 5	April 12	April 19	April 26	AGGREGATE. Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Aberdare U.D. Council	497	323	763	460	460	490	425	580	530	769	3	1,880	—
Aberdeen Corporation	2.257	2.279	2.265	2,160	2,192	2.546	2.567	2.868	2.892	3,091	47	122,721	+ 20.498
Ayr Corporation	366	492	367	364	416	422	530	478	544	754	48	28,195	+ 5,940
Belfast City	...	...	...	...	...	...	...	...	...	...	—	—	—
Birkenhead Corporation	1,959	2.042	1.894	1.876	2.073	2.243	2.392	2.353	2.398	2.530	3¾	9.260	+ 1,413
Blackburn Corporation	1.601	1,441	...	...	2 374	1,881	2,085	2,269	1.989	3,873	4¼	10.217	+ 3.332
Bradford Corporation	7.283	6.309	7.665	6.705	7.527	9.601	7.741	10.203	11.395	13.612	4	42.951	+ 12.896
Burnley Corporation	2.444	2,139	2.014	1.863	2,115	2.729	2.701	3.003	3.681	3.529	—	—	—
Burton-on-Trent Corporation	383	406	361	385	377	405	401	404	499	502	4	1,748	+ 282
Bury Corporation	1.981	1.783	1.626	1.554	1.879	1.962	1.945	2.176	3.052	2.749	3¾	9.823	+ 2.981
Chatham and District	1.290	1.342	1.168	1.137	1.170	1,246	1.308	1.418	1.499	1.794	16	20.735	+ 1.637
Cork Electric	669	621	623	589	495	501	558	619	632	710	16	8,996	— 614
Derby Corporation	1.356	1.458	1.279	1.284	1.440	1.448	1.527	1.518	1.709	1.798	4	6,318	+ 857
Dundee City	1.532	1,687	1.513	1,606	1,538	2.024	2.050	2.183	2.201	2.380	49	97,124	+ 20.075
East Ham Corporation	1.404	1.353	1.268	1,187	1,288	1,688	1.704	1,927	1,948	2.020	3¾	7,064	+ 2.361
Glasgow Corporation	27.691	28.475	28.122	28.263	28.659	29,789	30.419	31.211	30.938	33.353	47¼	1,360.179	+ 103.368
Glossop (Urban Elec. Supply Co.).	204	195	171	160	175	208	215	225	264	259	17	3,726	+ 693
Halifax Corporation	2.548	...	2,376	2.204	2,227	2.495	...	3.080	3,037	5.268	3¼	11,761	+ 3,501
Halifax Corp. Motor Omnibuses	56	...	53	51	52	56	...	71	73	109	3¼	264	+ 80
Huddersfield Corporation	3.307	4.400	3.173	3.062	3.441	3.796	3.911	4.345	4.633	6.392	4	19,282	+ 5.205
Ilford U.D. Council	839	997	899	876	871	1,047	1.072	1.123	1.225	1.254	4	4,418	+ 1.087
Ipswich Corporation	686	771	617	602	662	637	690	747	901	896	4	3,081	+ 654
Isle of Thanet	218	286	212	177	220	343	530	562	978	1,079	29¾	11,193	+ 5.758
Kilmarnock Corporation	235	249	238	223	239	264	264	288	286	320	49¾	13,302	+ 2.854
Lanarkshire	3.463	3.732	3.547	3.519	3.575	3.577	3.595	3.871	112	861	16	53,006	665
Lancashire United	...	...	...	...	...	...	...	...	...	...	—	—	—
Leeds City	11,454	12.824	10.713	10,736	11.411	14.312	14.915	15.334	16,187	20,226	4	63,111	+ 22.230
Leicester Corporation	4,436	4.765	4,101	4.211	4.235	5.148	5.207	5.847	5.776	6,365	—	—	—
Leyton U.D. Council	1.921	2.096	1.858	1.819	1,766	2.636	2.608	2.807	2.903	3.723	4	12,041	+ 4.502
Liverpool Corporation	17.198	17.784	16.736	16.557	17.415	21,698	21.354	22.329	22.520	24,173	16¼	342.692	+ 65,082
Llandudno and Colwyn Bay	327	537	325	315	332	313	346	385	467	819	21	7,039	+ 1,399
London County Council	56.073	57.285	55.333	55.324	54.253	71.085	70.763	74.928	75.104	82,637	3¾	253,209	+ 71,852
Maidstone Corporation	263	378	262	231	237	274	394	321	321	405	3¾	1.441	+ 332
Manchester Corporation	24.365	24.664	23.311	22.850	24 520	27.650	28.065	29.419	31.138	27.024	4	115,647	+ 22.633
Newcastle-on-Tyne Corporation	8.805	8.788	8.551	8.460	8,787	8.478	8.607	8.960	9.289	7.487	4	34 343	+ 2.246
New St. Helens and District	...	...	...	...	...	...	...	...	...	...	—	—	—
Northampton Corporation	...	778	869	881	873	...	619	1,152	1,265	1,522	4	4,558	+ 1,157
Nottingham Corporation	5.150	5.933	4,948	5,156	5,311	6.611	6.789	6,731	7,231	7,983	4	24.747	+ 6.008
Oldham Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
Reading Corporation	1,253	1,223	1,164	1,157	1,176	1,339	1.365	1,515	1,551	1,633	3¾	5,295	+ 1,272
Rhondda Tramways	...	...	...	...	...	...	...	...	...	...	—	—	—
Rotherham Corporation	2.168	2,124	1.954	1,988	2.094	2.119	2,142	2.165	2.863	2.362	4¾	10.015	+ 1.156
Sheffield Corporation	12.784	13.883	12.717	12.688	13.637	16.072	16.725	16,704	17.215	18,231	4¾	80,163	+ 18,331
Southampton Corporation	2.362	2.613	2,364	2.274	2.344	2.407	2.476	2.578	2,538	3,181	3¾	9.052	+ 813
Southend-on-Sea Corporation	707	...	691	676	677	1,145	...	1,372	1,403	2,689	4	5.835	+ 2.306
South Shields Corporation	1.132	1,179	1.031	1.010	1 059	1,234	1.248	1,342	1 479	1,601	4	5,358	+ 1,419
Sunderland Corporation	2.020	2,179	1.981	2.038	2,069	2.694	2.498	2.731	2.974	3,080	4	11,283	+ 3,015
Swindon Corporation	301	...	298	266	279	264	...	286	295	438	3¼	1 097	+ 172
Torquay Tramways	820	979	796	708	785	752	830	919	907	1,507	16	13,030	+ 1 473
Tyneside Tramways and Tramroads	1,012	1,116	909	871	908	884	884	984	964	1 618	17	14,526	+ 304
Wallasey Corporation	1.648	1,846	1,511	1,481	1,615	2,040	2.111	2.247	2,477	2.958	3¾	9.308	+ 3,026
Walsall Corporation	1.387	1,451	1,070	1,096	1,114	1.310	1.315	1.337	1,405	1,800	5	5,519	+ 949
Walthamstow U.D. Council	1.321	1,504	1,221	1,165	1,220	1,440	1,526	1,646	1.834	2,025	4	7,081	+ 2,516
Warrington Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—
West Ham Corporation	3,905	4,184	3.797	3,845	3.781	4,813	4,884	5,193	5,334	6,271	3¾	18,802	+ 4,923
Wigan Corporation	...	...	...	...	...	...	...	...	...	...	—	—	—

*** A number of undertakings suspended the issue of traffic returns for the duration of the war.

Colonial and Foreign Tramway Traffic Returns.

NAME OF COMPANY.	1918. WEEKS ENDED. Mar. 30	April 6	April 13	April 20	April 27	1919. WEEKS ENDED. Mar. 29	April 5	April 12	April 19	April 26	AGGREGATE. Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Anglo-Argentine	53,346	57,588	58.041	59.417	57.721	61,541	66,988	60,190	55,406	65.483	17	984,067	+ 46.393
Calcutta Rs.	66,690	70,023	73.597	73.362	71,869	81,666	85,553	75.391	79,416	80.494	16¼	1.410.741	+201.016
Madras Rs.	...	...	...	(2 weeks)	42,911	...	...	...	(2 weeks)	44.706	17	271,568	− 49,156
Pernambuco	4,341	4.616	4,496	4.441	4.387	5.563	5,811	5,436	5.448	5,385	16¾	89.803	+ 11.478

Companies issuing Monthly Statements only.

	1917. Nov	Dec.	1918. Jan.	Feb.	March.	April	1918. Nov.	Dec.	1919. Jan.	Feb.	March.	April.	Wks.	AGGREGATE. 1918-19.	+ or −.
	£	£	£	£	£	£	£	£	£	£	£	£		£	£
Ballarat & Bendigo	3.405	3.228	4 505	3.573	3,803	...	3.570	3.884	4.504	3.602	3.051	...	48	42,131	+ 1.444
Brazilian Trac. Mlrs	7695000	8069000	7837000	7315000	...	...	7581000	8531000	8522000	7972000	...	...	8	16494000	+1,342.000
Brisbane	32.901	35.019	34.500	...	...	...	39,246	38.135	38.575	...	...	...	4	38,575	+ 4,075
British Columbia $	525.629	555.555	559,569	501.150	510.892	...	612.893	691.065	667.489	645 415	649.120	...	38	5.390,119	+ 894.948
Buenos Ayres L'c'z.	39.678	40.901	38.902	34,397	42,647	41,643	42,952	50.460	41,556	42,429	47.370	43,607	43	434,186	+ 46,122
Burma	27,760	26.224	25,430	22,985	27,906	...	34,407	34.593	38,265	35,926	38,440	...	34	289,170	+ 77,029
Cape Town	16.522	...	...	...	...	...	18.385	...	...	...	...	...	—	—	—
Carthagena & H.	3,932	4,424	4.011	4.031	5.316	4,200	2,988	2,950	3.655	2,351	2,400	1.786	17	10,192	− 7.366
Cordoba	...	...	12,844	...	...	...	...	...	13,942	...	...	...	44	145.654	+ 10.915
East India	871	1.099	1.176	1.318	1.729	1,791	1,947	2.048	1,970	1,689	2,016	1.920	38	17.548	+ 5.261
Kalgoorlie	2,641	3.044	...	...	...	...	2.933	2.848	...	...	...	...	52	33.686	+ 1.078
La Plata	3.742	4.606	4.711	4.746	5 348	5,169	5,334	5.792	5,730	5,698	6.592	5,630	17	23,650	+ 3.677
Lima	37.249	43,198	43.561	41.921	...	...	44,948	47,887	45.362	46.082	...	...	8	91,444	+ 5,962
Mamoos Rs.	...	...	...	...	...	...	...	...	...	...	...	...	—	—	—
Manila	$ 159,000	169,000	167.000	...	...	...	214,292	236,612	231,585	...	...	...	52	2.326,884	+ 525.609
Monte Video	...	34.025	36.016	34.573	36,659	...	...	38,441	40.910	38.772	41.070	...	21	190.891	+ 18.558
Peruvian	$ 999,680	1101090	1189350	925.410	...	...	897.090	1057990	1009650	943.470	...	...	34	7,973,835	− 229,195
Para	...	23,315	24,060	22.198	24,848	...	...	23,800	24,515	23.248	26,022	...	17	97.585	+ 3,164
Port Elizabeth	3.807	...	...	...	...	...	3.498	...	...	...	...	...	—	—	—
Rangoon	5.358	5.438	5.361	5.662	5,955	5,885	6,611	6.188	6.373	5.694	7.533	6.217	17	25,817	+ 2,954
Toronto	$ 1052000	...	1068319	981 933	1113472	...	1071106	...	1106840	1015797	1083285	...	13	3,205,922	+ 42,198
Winnipeg	$ 305.831	...	334 642	298,899	307.289	...	283,721	...	390.539	371.162	384,937	...	13	1,146.638	+ 205.808

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Outlying districts, badly served by railways, have always been a trouble to manufacturers by reason of the delay caused in making deliveries.

Traders recognise more and more that delivery time is a serious item of expense. Goods lying in trucks in railway sidings are so much dead capital—a few days saved on a number of consignments will easily pay the interest on the investment of a Daimler Commercial Vehicle.

The Daimler is as reliable and certain as other methods of transportation are unreliable and irregular. It solved the problem of London street traffic. Its records for maintenance, as certified by leading corporations and municipalities, are the lowest known.

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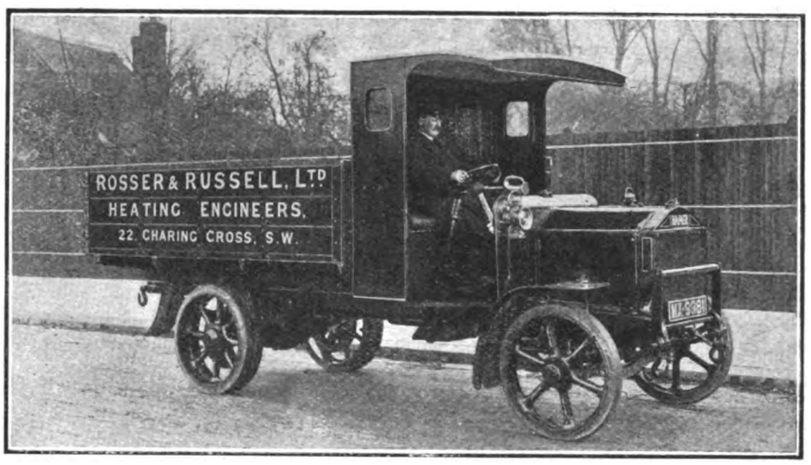

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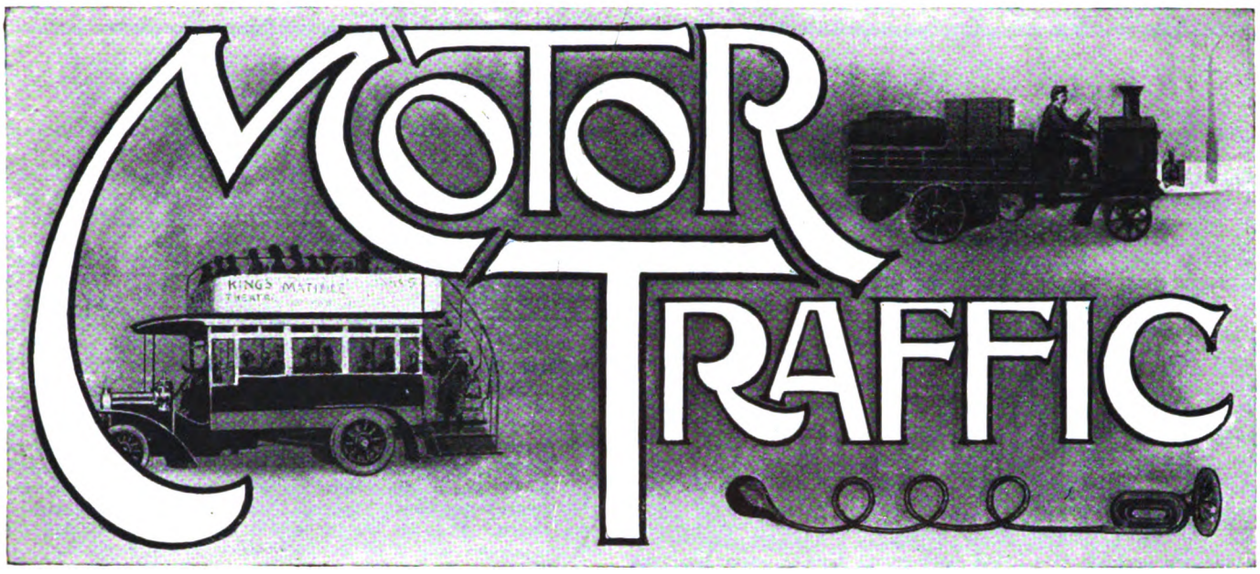

RELIEF AT LAST.

The concessions granted by the Chancellor of the Exchequer in his Budget affect both the motor manufacturer and the motor user in such a way that satisfaction has been expressed almost universally by those concerned. There is the more reason for gratification because this is not a period of general reduction of taxation. There is one other reduction, to which we shall presently refer, which favours the motor as well as other industries, but otherwise the changes in taxation are in the upward direction. Another kind of spirit—the alcoholic brand—has been subjected to a further large increase of taxation, but it is still permissible to hope that in the future large quantities of it will be available duty free for use as motor fuel. Meanwhile, under the present Budget, we have the removal of the petrol licence, the reduction of the tax, and the release of benzol from all taxation. Though benzol by itself is not in first rank favour in motoring quarters, it can in any case be used in conjunction with petrol. It is understood that large stocks of benzol no longer required for the manufacture of explosives are available, and existing facilities for the production of this fuel on a large scale can if necessary be maintained. With the concessions now made, the demand for all sorts of motor vehicles is bound to be stimulated, and it may be some time before manufacturers can fully meet it. What is wanted at the moment is the release for civilian purposes of the great number of heavy motor vehicles in the possession of the military authorities and now no longer required by them. Anything in the shape of an omnibus, or any chassis which would be suitable for an omnibus body, will be welcome both to the omnibus owners and to the general public in London, where the congestion of public service vehicles becomes more and more intolerable.

EXCESS PROFITS.

The reduction of the excess profits tax from 80 per cent. to 40 per cent. will be specially welcome to motor vehicle manufacturers at a time when any special profits which accrue can be advantageously utilised for developing productive facilities. The more effectively the manufacturers are able to meet new demands for commercial and pleasure vehicles the greater are, or should be, their profits, and a respectable modicum of these over what they made in 1913 should be left in their hands, so that the money may be put into the business. That seems to be a better plan than raising or attempting to raise fresh capital. It has also to be considered that profits are subject to income-tax, if not taken away under the excess profits scheme, so that the State is not altogether a loser. The short-sightedness of the policy of the Parliamentary Labour Party cannot be better illustrated than by their objection to the reduction of the excess profits tax. It is, however, only one other example of their efforts to kill the goose which lays the golden egg. We are always hearing about education; what about an education campaign for instructing the Labour Party in economics?

THE SLOUGH MOTOR DEPOT.

It is gratifying to find, at the time of writing, that the public inquiry instituted by the Government—under pressure—into the circumstances of the inception and carrying out of the great motor vehicle repair depot at Cippenham, near Slough, has got fully started. We are at all events to have the full facts, and if there is any blame it can be properly apportioned. The subject of this depot and the enormous cost of it have been hotly debated in the House of Commons, more especially within recent months, when it became apparent that war exigencies were over. Some people wanted the enterprise to be abandoned altogether. Mr. Churchill, the Secretary for War, made a speech in the House which certainly put a more reassuring aspect on the matter than it had hitherto worn, and he advanced what appeared to be good reasons for completing the scheme on a somewhat smaller scale than that originally intended. In view of the general feeling, however, he was well advised to agree to a public inquiry. Pending the result of that investigation, we do not desire to express any definite opinion on the merits, but would say that the motor industry of the country will be at least as keenly interested in the conclusions arrived at as any other class of the community. Many members of that industry are interested because in normal times—and normal times are coming again—they will probably do a good deal of work in the repairing of motor vehicles.

PNEUMATIC TIRES FOR HEAVY VEHICLES.

In these days of high pay for labour increased interest is attached to the question of using pneumatic tires for heavy vehicles. Some years ago experiments were made with pneumatic tires both for omnibus and industrial work, and the trials are being revived now that the experience of the Goodyer Tire Company in

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the United States have brought about a far more hopeful outlook. Given a suitable tire as the result of the improved conditions of manufacture now available in this country, it would not be a difficult matter to secure an increase of the speed limit of 12 miles per hour allowed for heavy vehicles, whether fitted with pneumatic or solid rubber tires. British makers and users will be interested in the conclusions on the subject that were recently placed before the Metropolitan section, Society of Automotive Engineers of the United States. Mr. B. B. Bachman's paper set forth that from the available data it would seem safe to say that pneumatics had become common and proper for vehicles up to 1,500 lb. capacity. From 2,000 to 3,000 lb. inclusive there is a strongly marked tendency towards pneumatics, and on 2 to 2½ ton trucks they are just making an appearance, though on the larger sizes there is no practical evidence available. Although large trucks of three, four, and five tons capacity had been fitted, the fact that the tire makers are not listing them would indicate that the innovation in those cases is still in the experimental stage. While admitting that some of the advantages claimed are so obviously correct as to need no discussion, Mr. Bachman asserted that other claims are open to considerable question. The claims of advantage which are made comprise reduction in mechanical repairs, increase in permissible speed, decrease in fuel and oil consumption, less fatigue for drivers, lessened wear of roads, and greater tractive facility. While reduction of mechanical troubles can be accepted as a fact almost without comment, a point to be considered is that although the net trouble is reduced, a proportion survives only changed in character, owing to the greater engine speeds attained when pneumatics are used. It will thus be seen that for the heaviest vehicles the change is not likely to be all plain sailing, but will entail a great deal of watchfulness.

ROADS AND ROAD VEHICLES.

A Plea for a Comprehensive Road Transport Policy.
From a Correspondent.

The Transport Ministry being now to all intents and purposes an accomplished fact, it would appear that the most useful course to take is to endeavour to indicate the lines of a constructive policy which would make the new Ministry a really efficient and beneficent guardian of road transport interests. The details of the Minister's policy as regards the roads themselves may at present be left to experts on that side of the question. It will suffice to say that a number of very admirable suggestions were contained in a lengthy letter from Mr. Rees Jeffreys published in the *Times* a few weeks ago. Among the points emphasised were the necessity for classifying roads and maintaining the higher classes of roads partially by means of State grants; the need for powers for limiting the minimum width of roads and making provision for widenings, so that when increased traffic makes these necessary they can be effected at a reasonable cost; the desirability of improving the quality of labour available for work upon the roads by increasing the remuneration and improving the status of the men so employed.

As regards the other side of the problem, that is to say, the use and construction of road vehicles, there is a great deal of work lying to the hand of the new Ministry. The law as regards the use of motors is at present in a very incoherent condition. It needs to be simplified and co-ordinated. The whole of the law should be contained in one Act, and should be made comprehensive to the average man without legal training.

From the very first the officials of the Transport Ministry must get clearly into their heads the fact that roads and road vehicles form in effect two portions of the same organisation. It is time that we got rid forever of the old idea that what was required was a compromise between two antagonistic interests; that all vehicle owners were desirous of using the roads freely, and that all road authorities were desirous of keeping down the cost of road maintenance and improvement. The fundamental fact which needs to be appreciated is that the cost of transport is made up of two main items, namely, the cost of running and maintaining the vehicle and the cost of maintaining and improving the track upon which the vehicle runs. The case is analogous to that of the railways, the financial results of which depend just as much upon the permanent way as upon the rolling stock. In all such cases there must be what might be called an internal clashing of interests. The particular department responsible for any one duty naturally strives to show good economy within itself, but above the departmental managers there must be a general manager whose business it is to see that a saving effected by one department does not involve an inevitable and much higher increased expenditure in some other department. It is no use to keep down the cost of maintaining our permanent way if by so doing we vastly increase the cost of carrying goods or passengers along it.

There are presumably very few people who would deny that road improvement is needed, but there is distinctly room for diversity of opinion as to the ultimate purpose of that improvement. In some quarters it would be argued that the object is, by a capital expenditure in the first instance, to reduce the subsequent annual cost of maintenance. Others, whose reasoning is more sound, would regard the purpose of road improvement as being identified with improved economy in transport upon the road, and only in a secondary degree designed as a means of reducing the cost of road maintenance. The whole thing comes down to the question of whether, when roads have been improved and strengthened, advantage should be taken of the fact to give increased facilities for transport by means of road vehicles, or whether all the old limitations shall be maintained so as to economise on the roads themselves while limiting the efficiency of the vehicles to a very serious extent. In the opinion of the writer, every stage of road improvement should be marked by an equivalent withdrawal of restrictions upon the use of roads. In other words, if we have stronger roads with better services we can, without actually increasing the cost of road maintenance, permit higher speeds and higher axle weights to road transport vehicles. The work that a vehicle can do in the course of a day is proportional to the produce of its useful load into its effective speed. By increasing either load or speed we increase working capacity. In other words, we provide the driver with a more efficient machine, and consequently we increase the driver's output. Progress in any industry depends upon our ability to increase the output of the individual worker, and the importance of doing so becomes greater and greater as the worker realises his right to receive decent remuneration and to work under decent conditions and for reasonable hours.

We know that a strong and well-made main road, built in the light of modern knowledge, will certainly suffer less from the passage of a vehicle at fifteen miles an hour than would an inferior local road from the passage of the same vehicle at ten miles an hour. The moral is that we should use road improvement as a means of enabling us to render road traffic more efficient. It does not follow that this can best be done by increasing speed limits. Possibly the desired results should be rather obtained by increasing axle weights. The two processes are, however, closely interconnected. If we increase the limit of axle weight for vehicles permitted to travel at a given speed, we are in effect introducing into each category vehicles which hitherto were limited to a lower speed. If we could so far improve our roads as to make it possible to increase the axle weights of vehicles coming into every category by 50 per cent., we should thereby have reduced very largely the cost of transporting a given load over a given distance. An increase in axle weight would in almost every case mean a considerable increase in the percentage of the total weight represented by useful load. If we could carry, say, eight tons instead of five tons on the heaviest type of motor vehicle, the consequence would be to reduce the cost per ton mile by something like 35 or 40 per cent. The same effect could be produced all down the line, and in this way enormous aggregate savings would be effected. The trouble is, of course, that these savings are not apparent in any big national balance sheet. The consumer ultimately pays the cost of transport, and the saving would only be realised inasmuch as it would decrease the cost of living of the consumer, that is to say, of the whole community. On the other hand, a saving in road maintenance costs can be shown in an annual statement. An economy of this kind is obvious, and the man who can effect such an economy has an apparent claim upon our gratitude. Thus, the temptation is always in the direction of saving in road maintenance rather than in vehicle operating

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MOTOR TRAFFIC

costs, and a very broad point of view must be established before this tendency can be counteracted.

Anot er big opportunity for economy capable of being realised by a judicious change in the law is to be found in connection with the use of trailers. At present the legal speed limits are such that the employment of a trailer behind the average motor vehicle actually reduces its daily working capacity. Thus, the use of trailers even where they could be drawn with ease and advantage, is definitely discouraged. So also is any serious attempt to overcome the opposition that can certainly be levelled against trailers of the ordinary type. The law admits no distinction between the ordinary trailer and any improved, safer, and more manageable variety. To get rid of the inherent disadvantages of the old trailer method must almost certainly involve some degree of complication which must in turn put up the cost of the vehicle. If the law offers no compensating privileges, it stands to reason that any attempts at improvement are practically certain to be nipped in the bud.

THE BUDGET AND TRANSPORT.

IMPORTANT DECISIONS OF THE CHANCELLOR.

In the course of his Budget speech on April 29, Mr. A. Chamberlain, Chancellor of the Exchequer, said :—I come now to motor spirit. The duty was imposed by the 1909 Budget. The full duty was 3d. per gallon, raised in 1915 to 6d. for cars used for private purposes. Cars used for trade or husbandry, doctors' cars, cars of veterinary surgeons, and cars used for professional purposes are all entitled to a rebate, while fire engines, certain other cars, stationary engines, and aeroplanes are entitled to motor spirit free of duty. In 1914 about 47,000,000 gallons paid full duty, over 40,000,000 gallons half duty, and about 8,000,000 gallons were delivered free of duty. A tax of that character is open to serious objection. It is complicated, and therefore it is expensive to administer and collect, and its dutiability is not in the nature of the article, but in the use to which it is applied. The same spirit exactly is dutiable if used for one purpose and not for another. The machinery for the collection of the duty provides that the duty is to be collected on all, and repayment made where the user is entitled to the abatement. In practice, though the extreme inconvenience is overcome by large users like the London General Omnibus Company, an irritation is set up which is correlative, not to the value of the tax so much as to the trouble of investigating the various claims. The committee will observe that in a tax of that kind, collected in that way, there is a wide opportunity for evasion and fraud. (Hear, hear.) I think there would be a great deal to be said for levying a charge, whatever it might be, on users of motor cars in forms other than a tax on petrol. But a satisfactory scheme of licences could only be worked out after careful investigation.

Before I formulate any scheme I wish to have the assistance of the Minister of Ways and Communications, and I propose to discuss this question with him between now and the next Budget, and I hope that on the next Budget I or my successor will be able to make proposals to the Committee. (Hear, hear,)

There are two points on which I must say something at once. The first relates to the existing excise duty on motor spirit. That duty brings only a trifling sum—£50,000 a year—and is derived almost entirely from Scotch shale oil. But a difficult position has lately arisen with regard to benzol manufactured in this country. Before the war benzol was a spirit experimentally used for driving motor cars, but was not taxed when so used. The war changed the position. During the war the production of benzol for war purposes, stimulated by the Munitions Department, developed with remarkable results, and there is now in existence a large manufactory with a very large stock of spirit no longer required by the Munitions Department, and which has a large output of something like 70,000 tons ; and the Petrol Control Committee undertook to release this for the use of motor car users. But then the Board of Customs and Excise thought it to be their duty to step in and to issue a warning that benzol so used would be subject to taxation. Here we have the case of an industry found vital during the war, created and stimulated for war purposes, practically created at the Government's instigation and under Government guidance, which industry is threatened with the loss of its market owing to the cessation of war. That is not all. Benzol is not only important to the nation as an additional indigenous source of supply of motor fuel, but it is a very important ingredient in dyeing, an industry the growth and establishment of which in this country we have done everything to promote. (Hear, hear.) Under the circumstances, and acting on the advice of the Board of Trade, I propose to give legal authority to the exemption of benzol from taxation. (Hear, hear.) There is yet another subject connected with motors, the motor spirit licence. (Hear, hear.) That was imposed as a war measure to restrict the use of private cars at a time of shortage. The revenue was purely secondary. The necessity for the restriction has now gone. It was collected by a department of the Board of Trade. That department, which, I think, did its work extremely well, will be dissolved by May 17, and I am told that if we dissolve it we shall enable the Board of Trade to put an end to the employment of the department, with its 300 officials. (Applause.)

THE "STEVENS" PETROL-ELECTRIC VEHICLE AND ELECTRIC WELDING.

A demonstration of the capabilities of the "Stevens" 3-ton War Office subsidy petrol-electric vehicle in supplying current for electric welding was given before a company of Press representatives recently at Messrs. Dennis Brothers' works, Guildford. The welding equipment used was that supplied by the Quasi-Arc Welding Company, of Laurence Pountney Hill, Cannon Street, E.C., and the demonstration included a wide variety of welding operations, all of which were executed in a most satisfactory manner and with remarkable rapidity. These included the building up of a solid feather on a piece of heavy shafting, the building up of a worn key-way on a heavy mild steel casting, and a number of other operations which clearly indicated the great value of a mobile plant which made such repairs possible to machinery and structures in position. A special feature of the demonstration was the fact that when working at 105 volts two separate and distinct welding equipments could be operated at the same time from the same generator, and further, that by means of an appliance recently developed by the Quasi-Arc Company, it has been found possible to work efficiently at 60 volts, which means that three separate welding plants can be run simultaneously.

After the welding demonstration was completed, the company were given an opportunity of testing the running capabilities of the "Stevens" machine in the hilly district which surrounds Guildford, and although the trip was made in an ordinary standard War Department lorry, the universal opinion was most favourable as to the smoothness of the running and the excellence of the control under all conditions of speed and gradient.

IMPERIAL MOTOR TRANSPORT CONFERENCE.

The Imperial Motor Transport Council, which organised the Imperial Motor Transport Conference, held in 1913, is in process of reconstitution, with a view to the organisation of further conferences in the near future. Lord Inverforth, Minister of Supplies, has become a vice-president. New members of the Council include—

General Sir A. R. Crofton Atkins, K.C.B., and Colonel C. V. Holbrook, representing the Ministry of Supplies.

Brigadier-General R. Manley Sims, C.M.G., D.S.O., Agent-General for Ontario.

The Hon. Edward Lucas, Agent-General for South Australia.

Mr. C. S. Wade, Agent-General for New South Wales.

Lieut.-Colonel P. Pelletier, Agent-General for Quebec.

Sir John McCall, Agent-General for Tasmania.

Major-General Sir Newton J. Moore, K.C.M.G., M.P.

Mr. H. C. B. Underdown (president), and Mr. Bernard Caillard (vice-president), representing the Association of British Motor and Allied Manufacturers.

Mr. E. S. Shrapnell-Smith, C.B.E.; and

Mr. G. Holt-Thomas.

The headquarters of the Council are at the Royal Automobile Club. H.R.H. Prince Arthur of Connaught, K.G., K.T., is president, the Hon. Sir Arthur Stanley, C.B.E., C.B., is chairman, and Mr. Horace Wyatt is the organising honorary secretary.

OMNIBUSES AND GOODS TRANSPORT.

West Hartlepool and Walsall Corporations are promoting Bills to confer powers to run omnibuses within the boroughs and along specified routes. It is asked that the Corporations be empowered to convey goods as well as passengers. Walsall Council ask that all or some of the provisions relating to tramways, trolley vehicles, and omnibuses contained in the Acts and Orders of the Corporation be extended to and apply to the omnibus undertaking.

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MOTOR TRAFFIC

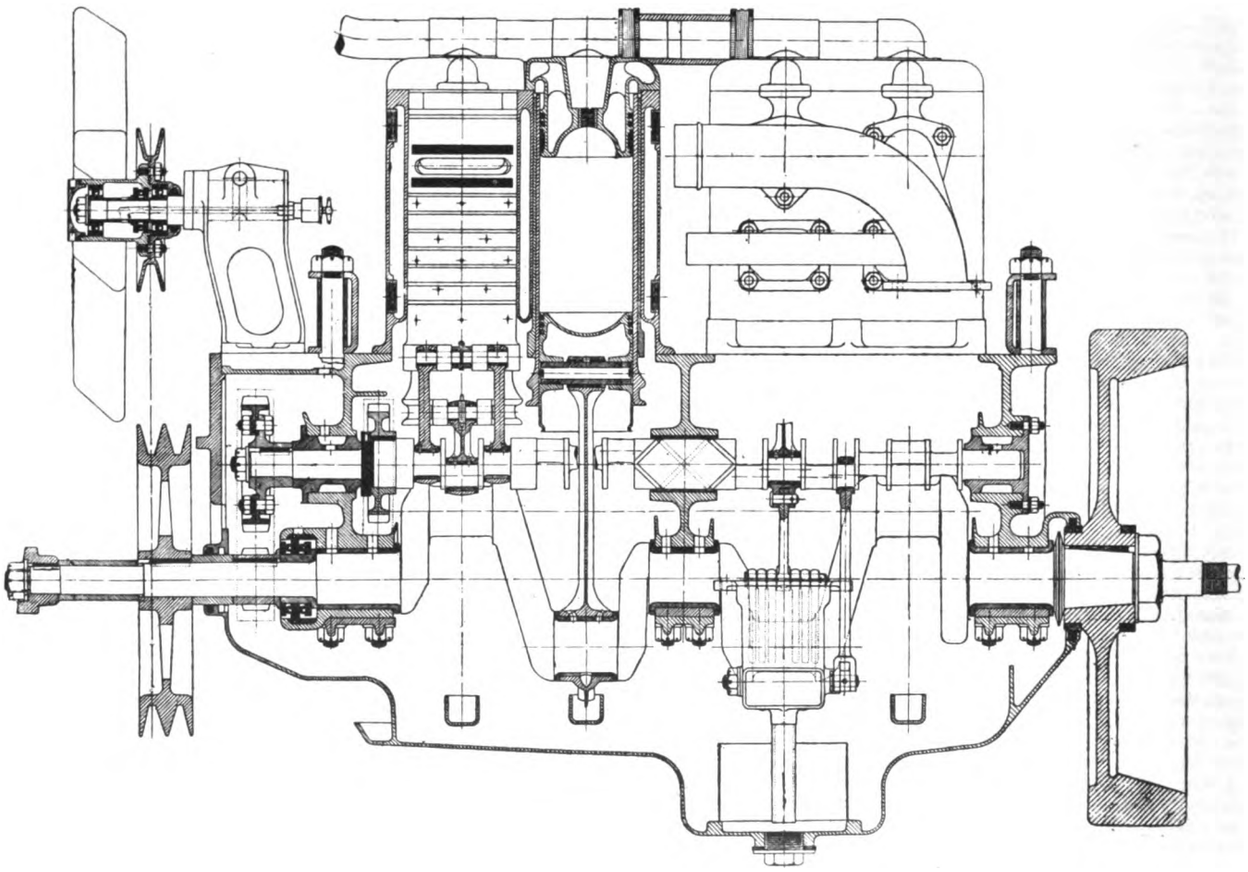
DAIMLER 2-3 TON CHASSIS.

Two Types for Passenger and Commercial Use.

Considering that during the war the Daimler Company, of Coventry, were obliged to put their customers on a waiting list, which attained considerable length, the firm have not been an unreasonable time before inviting purchasers generally to give consideration to two of their post-war models. These have been admirably chosen from the point of view of what is likely to be the most general requirements for civil use. Further, the selected designs have the merit of suitability for two different classes of work, as demonstrated by the searching tests of war experience. These designs are the 2-3 ton chassis, which is produced in types CJ 22 and CK 22, of 11 ft. 6 in. and 13 ft. 6 in. wheel base respectively.

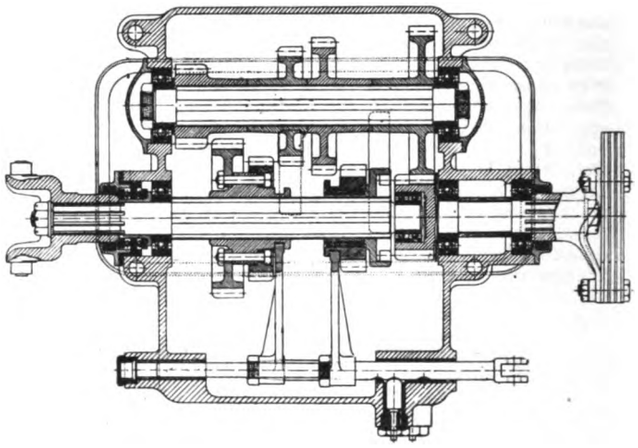
These lengths are suitable for lorry and wagon bodies, and for chars-a-banc and single-deck omnibus work. In both cases the 3-ton is inclusive of the body. There is a difference in the platform space (behind dashboard) which renders the second-mentioned model still more suitable for passenger work. While the platform space of the CJ type is 13 ft. 2 in., that of the CK type is 17 ft. 2 in., and the CK has a petrol tank of 20½ gallons capacity as against the 18½ gallons for the CJ. Beyond the foregoing item the two types differ but slightly. In each case the tank is fitted under the driver's seat, and the feed system is by gravity.

From the accompanying photographs and drawings the reader will be able to gather an idea of their merits. It speaks highly for the designers of the Daimler Company that the four and a half years of war service to which these models have been subjected have called for but few alterations or additions to the originals evolved in 1915. Practically the only important revision is to be found in the details of the transmission system; the other alterations are best described as refinements, which can be better appreciated by inspection than by description.



Daimler Sleeve Valve Engine.

The predominating impression which one gathers from the designs of these 2-3 ton chassis is the dual one of lightness and strength. These features may be described as the acme which builders of machines of moderate tonnage strive for. In this instance the attainment is assisted by the Daimler flitch plate type of frame, in which the members each consist of a wooden beam inserted between two steel plates, the combination then being rivetted together, as will be seen from two of the photographs.



Sectional Plan of Gear Box.

To complete the description the chief items of the specification are given below:—

Engine.

4-cylinder Daimler sleeve valve (patented).
Bore—95 mm. (3¾ in.).
Stroke—140 mm. (5½ in.).
Rating—22·4 h.p. (R.A.C. and Treasury).
B.H.P. developed—30, at 1,000 revolutions per minute.
Carburetter—Zenith. Ignition—Magneto. Lubrication—Trough splash, throttle controlled. Oil in base—2 gallons. Control—foot-operated accelerator pedal.

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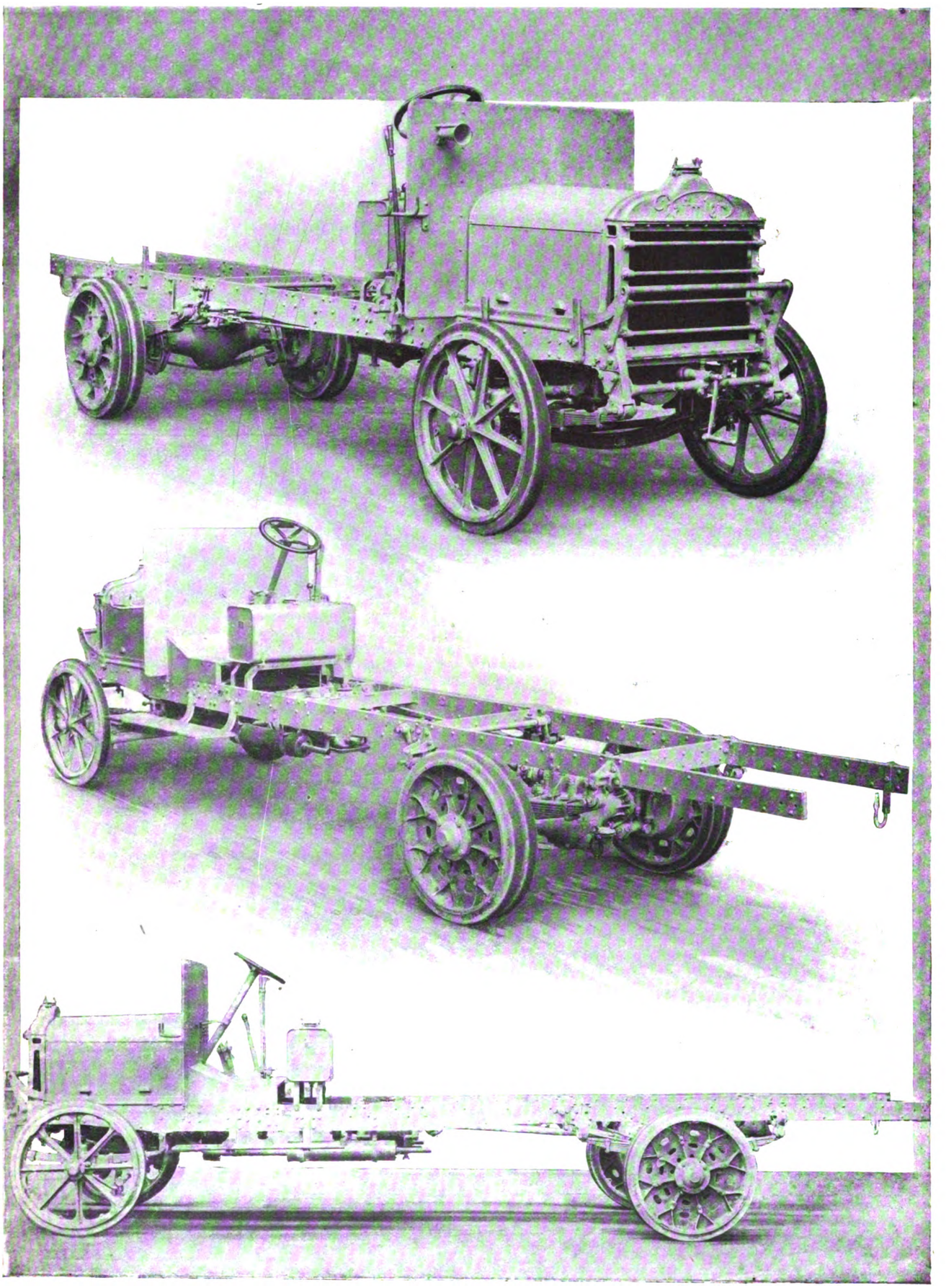

VIEWS OF DAIMLER 2-3 TON CHASSIS.

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TRANSMISSION.

Clutch—Cone, lined with fabric.

Two leather couplings between clutch and gear box.

Sliding universal joint behind gear box } Roller bearings,
Universal joint in front of axle } universal joints.
Overhead Lanchester worm gear } universal joints.

Ball bearings throughout, with rear wheels on Timken roller bearings.

Springs act as torque and radius rods.

Four forward speeds and one reverse.

Road speeds, at 1,000 revolutions per minute:—First, 3½ miles per hour; second, 7 miles per hour; third, 10 miles per hour; fourth, 14½ miles per hour.

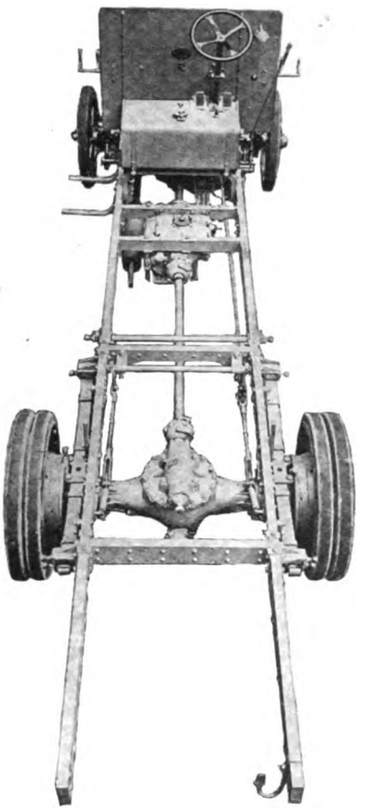
AXLES.

Front—I section, with wheels on bronze bearings.

Rear—full floating type.

STEERING.

Irreversible worm.



Rear View of Daimler 2-3 Ton Chassis.

BRAKES.

Hand and foot brakes—internal expanding type acting on rear wheel brake drum.

SPRINGING.

Front and rear—semi-elliptic.

RADIATOR.

Built-up type, with cast top and bottom tanks, and central assembly of gilled copper tubes. A substantial guard bar is fitted in front of radiator.

WHEELS.

Cast-steel, to take single tires on front and twin on rear. (771 rim diameter.)

TIRES.

Dunlop 900mm. 100mm. Single to front wheels and twin to rear. To suit 771 diameter rims.

CHASSIS WEIGHT.

Type CJ (11 ft. 6 in. wheel base)	49½ cwt.
Type CK (13 ft. 6 in. wheel base)	50½ cwt.

PRINCIPAL DIMENSIONS.

Wheel base—type CJ	11 ft. 6 in.
Wheel base—type CK...	13 ft. 6 in.
Wheel track	5 ft. 3 in.
Dash to centre of rear axle—type CJ ...	9 ft. 4 in.
Dash to centre of rear axle—type CK ...	11 ft. 4 in.
Centre of steering wheel to—	
Top of frame	39 in.
Dash	18 in.
Diameter of steering wheel	18 in.
Ground to top of frame (loaded)	32½ in.
Ground clearance (minimum)	9½ in.
Turning circle—type CJ	46 ft.
Turning circle—type CK	52 ft. 6 in.

It is important to note that the company provide a convenient method of attaching the various kinds of bodies. A further advantage is the means adopted for the suspension of the engine, which is consequently easy to remove in the event of repair being required. With the fourth speed put at 14½ miles an hour, an important step has been taken to preserve the life of solid tires and of the whole machine. With this reasonable maximum the makers are able to omit a governor as a standard fitting, thus lightening the fan driving pulley and facilitating the provision of electric lighting. The gross loaded weight of vehicle allowable is 5½ tons; £950 is the price of the chassis, exclusive of various fittings of standard design. Orders are taken for delivery in June or July.

SCUNTHORPE OMNIBUS SERVICE.

The "Karrier" omnibus illustrated on the opposite page is the first of a series which Messrs. Witham and Chatburn, of Scunthorpe, propose to run. Scunthorpe is a small town which has recently come into notice on account of its valuable mineral products, and it has grown so largely within the last few years that, as in many similar cases, passenger transport has become a problem of urgent importance. Messrs. Witham and Chatburn have seen the possibilities and anticipate success from their undertaking. The omnibus left the Karrier Works, Huddersfield, on March 22, and was driven through to Scunthorpe on the full speed limit, accomplishing the journey in a very satisfactory way.

MAILS BY MOTOR VEHICLES.

Greater enterprise is being shown by the U.S.A. postal department in adopting motor vehicles than is the case at present with the British Post Office. Replying to a question in the House of Commons, the Postmaster-General, in a written answer circulated prior to the Easter recess, stated that the practicability of extending the use of motors for the conveyance of mails in rural districts was under consideration. As to the suggested use of motor cycles and sidecars, he understood that it was probable that such vehicles released from the army would not be suitable.

During the month of March 2,700 motor trucks were allotted by the U.S.A. War Department for rural postal work, and 1,000 to the Health Department for the conveyance of supplies.

For ten years past the British Post Office has had experience of the economy and despatch resulting from the carriage of parcels by motor contractors. This course was adopted in consequence of the high rates which the railway companies sought to impose.

ELECTRICS AND THE NEW MINISTRY.

Colonel Crompton, President of the Commercial Motor Users' Association, entertains great hopes of a more vigorous future for battery road vehicles when the electricity supply comes under the rule of the Ministry of Ways and Communications. Speaking at a meeting of the association, he said the Ways and Communications Bill had in a sense made possible certain dreams that he had put before the association, one of them being the great extension of the electrical supply of the country, so that they would be able to supplement the motor vehicle by the electric vehicle propelled by batteries. The inclusion of the electrical distribution on a national scale within the Ways and Communications Bill would be the means of cheapening road haulage in a manner which he did not think possible until he had looked into the question very closely.

It will be remembered that in Committee on the Ways and Communications Bill on April 8, the Home Secretary announced that for the present the Government intended to drop the proposal to include electricity supply in the Bill, and that they would endeavour to effect the inclusion when the measure for the control of electricity is introduced.

INQUIRY INTO LONDON OMNIBUS FARES.—The Home Secretary, in reply to a question by Mr. Higham, said he was making inquiries as to the increased omnibus fares in London, and the London General Omnibus Company had agreed to place the fullest information at his disposal. When asked by Mr. Higham why it was in the power of the Home Secretary to fix taxi-cab fares, while he had no power to fix omnibus fares, Mr. Shortt replied that it was because Parliament had so appointed it. Mr. Archer-Shee asked the Home Secretary if he would use his influence with the Board of Trade to have the whole question referred to a Joint Select Committee of both Houses, but no answer was given. A few days later Mr. Higham asked the Home Secretary if he had commenced his inquiry into the reason for the increased omnibus fares in London. Mr. Shortt replied that he had obtained full details from the London General Omnibus Company, and he proposed to submit them to an eminent accountant to report on the question whether the increase in fares was justified.

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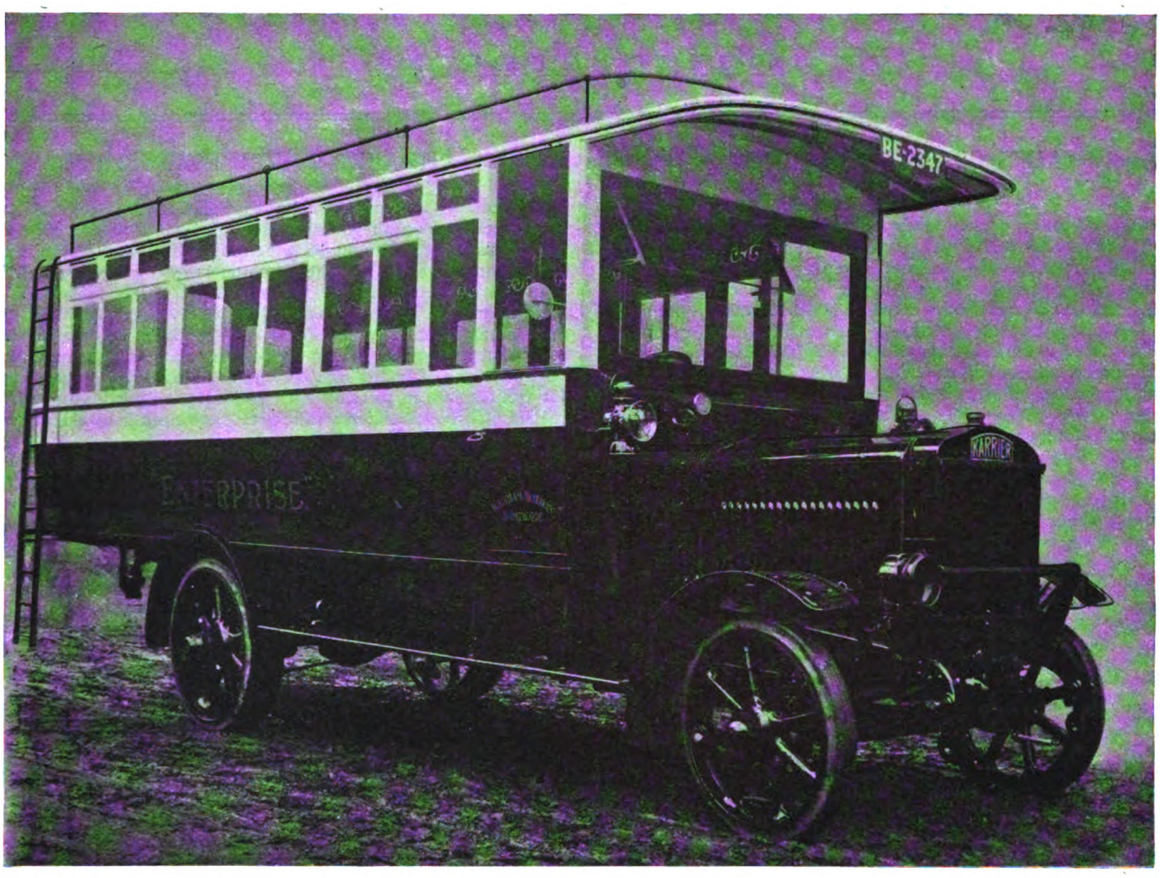

A "Karrier" Omnibus for Rural Service.

A Tipping Motor Wagon Built by the Associated Equipment Company.

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MOTOR TRAFFIC

BRITAIN'S COMMERCIAL MOTORS.

A Part to Play in the Solution of Problems.

According to figures presented to a recent assembly of the Commercial Motor Users' Association by Mr. W. Joynson-Hicks, M.P., the latest official returns show that there are 65,000 commercial petrol vehicles and 10,000 steam wagons in this country. Of the total of 75,000, over 35,000 were represented or owned by members of that association, which had 3,000 members and an income of £3,390. Although he was chairman of the Automobile Association, he was prepared to say that in the interests of the country the commercial vehicle came in front of any pleasure vehicle whatever.

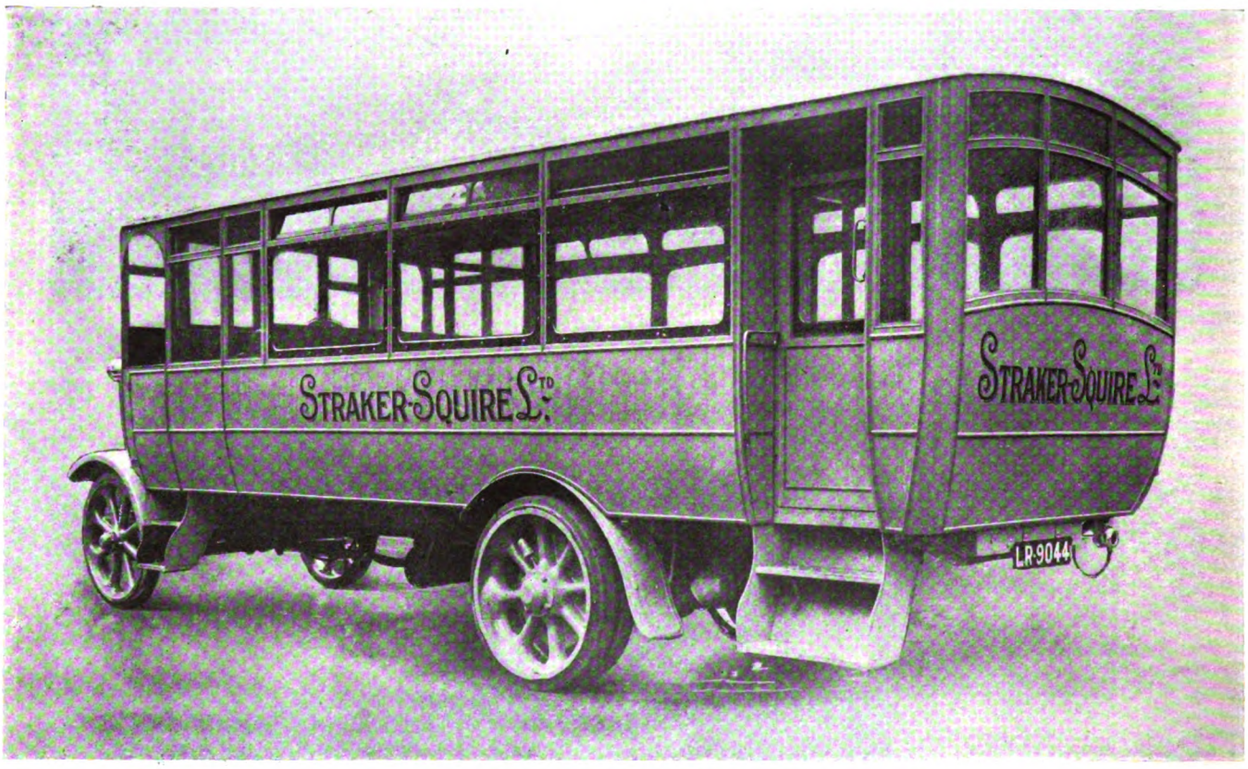
He believed that in the extended use of road vehicles and in the improvement of the roads they would find the solution of many of those great reconstruction difficulties which faced the Government at the present time. The questions of housing, small holdings, and agriculture were bound up with transport, and it was clear that there was no time, even if it were possible, to create either wide gauge or narrow gauge railways out into remote parts of the country. It was the commercial and industrial motor alone that could take the product of the farm to the market without transhipment; the workman from the shop or factory to his home direct; and bring the deserted village into touch with the pleasures and life of the adjoining town.

ROAD TRANSPORT'S REQUIREMENTS.

Mr. E. Shrapnell-Smith, chairman of the Commercial Motor Users' Association, has stated that the association sent a deputation to Sir Eric Geddes, the Minister of Transportation, and Mr. Shortt, the Home Secretary, suggesting in connection with the 48-hour week that something must be done at terminals of railways, docks, etc., to avoid delays. Other points brought forward were:—The motor spirit tax; proper books to be kept by local authorities so that they did not charge to road maintenance figures which ought not to be there, as many authorities charged the cost of cleansing and watering the streets to road maintenance, whereas commercial motor users contended that a large proportion of these charges were rightly matters of health and sanitation. The deputation also put to the Minister certain matters connected with home-produced fuel, questions connected with bridges, and proposals for amendment of the law on extraordinary damage to roads.

STRAKER-SQUIRE NEW MODEL.

The new 55 H.P. patent chassis which Messrs. Straker-Squire are now placing upon the market embodies a number of new features in chassis construction which cannot fail to interest all users of heavy motor vehicles. The machine is of an entirely new design, and will be known as the patent "A.W." type chassis, or "After War" model. It is claimed to be highly economical in working, and can be efficiently employed for net loads of from three to five tons, carrying either goods or passengers. In the latter capacity various types of bodies can be fitted, giving seating accommodation for from 20 to 40 passengers. The outstanding feature of interest to those responsible for public services running to a time schedule is the high engine power. There can be no question of the necessity of ample engine power when it is required to maintain a regular service under all weather and road conditions, even if it should entail a higher fuel consumption. In the present instance, however, it is claimed that owing to the perfection of the design of the engine the consumption of fuel and oil is remarkably low. The four cylinders are cast *en bloc*, having a 4½ in. bore with a stroke of 6½ in. It is governed by patent overhead valve gear. The two-bearing crankshaft is 3 in. in diameter, and is fitted with roller bearings. Lubrication is effected on a novel positive system which has been patented. With regard to fuel consumption, a number of test runs have been carried out under varying conditions, and it has been found that on straightaway runs seven to seven and a quarter miles per gallon can be depended upon when the vehicle is loaded to its full capacity; when empty this may often rise to ten miles.



Side and End View of Straker-Squire New Model.

Another important point which has received special attention is the distribution of weight. The design of the chassis provides for the carriage of a 5-ton net load on a 13 ft. body whose weight does not exceed 16 cwt. This is secured without exceeding the 6-ton axle weight, thus enabling the vehicle to do twelve miles an hour.

Compared with the ordinary subsidy type machine of equal capacity, the total overall length of the new Straker-Squire chassis saves about 2 ft. with the same length of body; it follows that for chars-a-banc and omnibus work the chassis can be fitted with bodies up to 15 ft. in length, giving an additional row of seats and allowing a seating capacity up to 40. Although the normal speed for 5-ton loads is 12 miles per hour, the chassis is built up with three different ratios of worm gear, thus rendering it suitable for travelling at higher speeds for lighter loads and public passenger purposes.

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MOTOR TRAFFIC

The steering gear is of the screw and nut type, with large wearing surfaces. An exceptional angle of lock of front wheels is provided for, and the gear is as easy to operate as an ordinary pleasure car.

Special care has been taken in the springing of the chassis; the springs are of large size, and all the spring supports are mounted on ball joints with large oil caps. Auxiliary coil springs are also fitted which compensate for unequal load and give easy riding under all conditions.

Hollow spoke steel wheels are employed, those in front taking single tires 140 mm. section, 850 mm. inside diameter, 1033 mm. outside. The rear wheels carry twin tires of the same dimensions. By their large size these wheels assist greatly in reducing the road shocks transmitted to the mechanism, and also the vibration to buildings along the route, a matter of considerable importance in town traffic. Both the pedal brake and the hand brake operate on pressed steel drums bolted to the rear wheels; these are 22 in. in diameter, with a 3-in. face lined with "Ferodo" fabric. The large surface not only ensures an exceptionally powerful braking effect, but gives long life to the linings and drums. The pressed steel frame which has a maximum depth of 7 in. has no rivets in its construction, all the cross members being attached by ⅝ in. bolts, only two lengths of bolt being used in the entire frame. The engine and gear box is carried on a short stiff underframe by a three point suspension, which gives a perfect and permanent alignment under all conditions.

Front View.

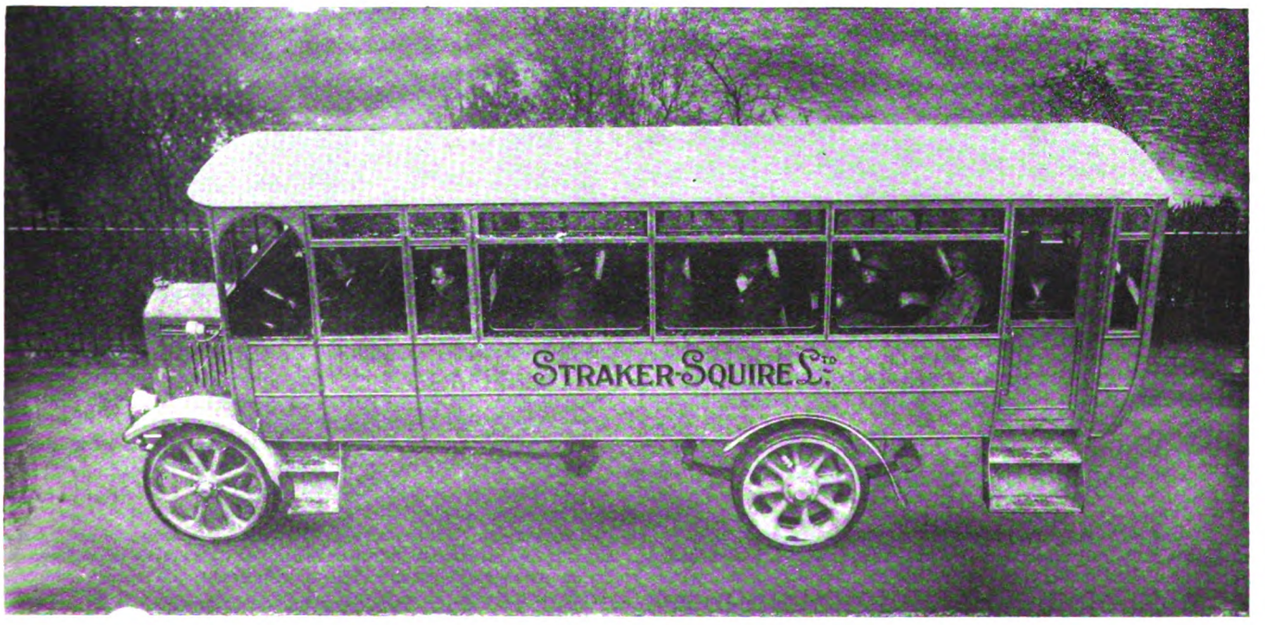
The overall width of the chassis is 7 ft. 1½ in., and the normal length 20 ft. For special purposes, however, it can be increased to a total length of 22 ft. 6 in., the wheel base in each case being 14 ft. 6 in. The single-deck omnibus body shown in our illustrations has been constructed for demonstration purposes. It was built by E. and H. Hora, Limited, of Peckham Road, London, S.E., and can be taken as an excellent example of public carriage work. The body is of the saloon type, with two compartments, the overall length from the dash being 21 ft. 6 in. The front compartment takes up 6 ft. of this space, and is the smoking section.

The main portion of the body is fitted with five garden-type seats to take two passengers on each side, and between these are sliding gangway emergency seats kept under the side seats when not in use, detachable leather straps forming a comfortable back. A long seat is fitted across the rear end to seat three passengers, with a tip-up cricket seat at the near end for one. There is also a tip-up seat at the rear end of the car opposite the entrance door for one person, making a possible seating capacity in the rear portion of 30.

The smoking compartment contains a long seat for five persons, next to the partition, and another for two beside the driver. The driver's seat is left short, so that access can be obtained to the compartment, but a tip-up seat for one is provided at the end making a total of eight, exclusive of the driver. The interior has been tastefully finished off with lining panels of 3-ply finished in the natural wood. There are three main body windows in the rear portion in polished mahogany frames, with folding ventilators to match. The main body windows are held in detachable brass fittings, and can be removed at will. All the seats are provided with spring cushions and stuffed and raised backs in imitation leather.

The usual coach type of door shown in the illustrations can be dispensed with, and a folding lattice-work steel door fitted in its place with a waterproof curtain inside to keep out dust and wind. Spring roller waterproof blinds are fitted over the high side doors to the front compartment, and also to the windows at the back of the driver to prevent reflections at night. The front compartment is entirely separated from the rear portion of the body by a partition panelled up to the window level, and continued to the roof by fixed plate-glass windows.

A Vandervell lighting set provides ample illumination of the interior; there are six lights in the rear portion of the body and



Side View showing Seating Arrangement.

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MOTOR TRAFFIC

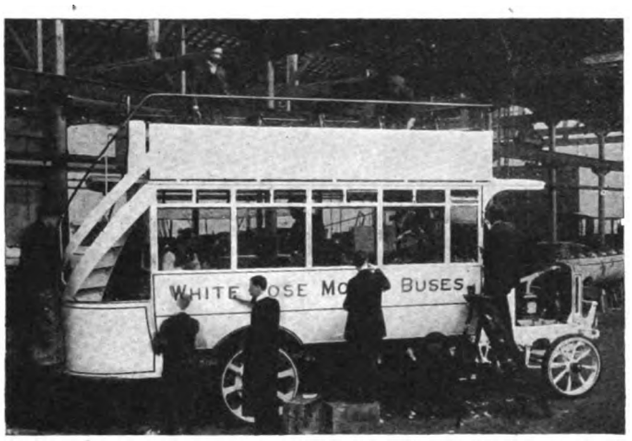
one in the smoking compartment, each of these being fitted with ornamental glass globes fixed to the roof. Head lights, side lights, and rear lights are also provided.

The exterior of the body is finished off in motor grey with darker grey mouldings and fine red lines, and presents a handsome appearance.

Messrs. Straker-Squire have already received orders for a considerable number of these machines, and with the completion of the organisation of their new works will be in a position to meet all demands; at the moment, however, orders can only be dealt with in strict rotation.

A LEYLAND OMNIBUS IN THE SHOPS.

One of the latest types of double deck omnibuses which are now going through the shops of Leyland Motors, Limited, is shown in the accompanying view. When the photograph was taken, the painters and upholsterers were just finishing off the vehicle at high



speed, in order to complete it for the Easter traffic. This particular machine is one of a small fleet for Rhyl and is mounted on a standard Leyland "G" type chassis, which carries a 34-40 H.P. engine.

CO-ORDINATION OF LONDON SERVICES.

In the House of Commons Mr. Leonard Lyle asked the right hon. Member for Cambridge whether he proposed to take in hand as one of the earliest aspects of policy the whole question of transportation in London; and whether his department will possess sufficient powers to regulate, co-ordinate, and extend the existing means of locomotion in London, apart from the tramways under the control of the London County Council?

Mr. Shortt, who replied, said: "My right hon. friend is fully alive to the importance of the question of London transport, and if and when his Ministry has been established he will go into the matter. Under the powers sought to be obtained by the Bill to establish the Ministry of Ways and Communications it should be possible to regulate and co-ordinate existing services to a considerable extent, and if these powers prove insufficient it will be for the Minister to consider whether Parliament should be asked to give further powers."

MOTOR SPIRIT LICENCES.

The Board of Trade announces that on and after May 17, 1919, motor spirit may be purchased without the production of a motor spirit licence. Any holder of a full-duty or half-duty motor spirit licence who has not been supplied with the total amount of motor spirit authorised to be supplied by his licence may apply to the Petrol Control Department for an appropriate repayment of duty, and such application must be accompanied by the licence in respect of which repayment is claimed. Repayment will not be made in respect of loose vouchers. Applications for repayment should be made as soon as possible after May 16, 1919, and addressed to the Petrol Control Department, 19, Berkeley Street, London, W.1.

INTERNATIONAL MOTOR CONGRESS.

DEMAND FOR REDUCTION OF TAXES AND DUTIES.

The Motor Legislation Committee announce that the automobile industries of Belgium, France, Great Britain, Italy, and the United States were represented at a recent meeting of the International Motor Congress held in Paris. The following resolution was adopted unanimously:—

"In view of the production during the present war by the automobile industries of the allied countries of war materials of all kinds, and of the services rendered by automobile transport of the highest importance to the armies; and in view of the fact that motor transport of passengers and goods is now an indispensable condition in modern life; that motor transport generally has long ceased to be a matter of luxury, and has become a necessity for commerce and industry; we recommend that the internal taxes and duties of all kinds direct and indirect which fall heavily on automobilists in most of the allied countries, be largely diminished in order to promote normal and progressive development of automobile communication, and that the product of these taxes and duties be applied to the upkeep and improvement of the roads."

A statement issued by the Motor Legislation Committee calls for the immediate abolition of the special duty of 6d. per gallon imposed on petrol by the Finance Act, 1916, and for the earmarking for the purpose of road improvement of the proceeds of the taxation of motor vehicles and motor spirit levied under the Finance Acts, 1910 and 1915. In the latter year the duty on motor spirit was doubled, and the revenue derived from the foregoing taxation was diverted to State purposes. The Committee point out that the development of road transport is entirely dependent upon the import of fuel, and they urge that the question of the encouragement of home-produced fuel is of vital importance to commercial and industrial prosperity.

LONDON TRAFFIC IMPROVEMENT.

Mr. Frank Pick, commercial manager of the Underground Railways Company, has stated that 62 cars for the Tube Railways are on order, and that tenders have been invited for 100 District Railway coaches as a first instalment. A new type of omnibus has been designed and the building of the new vehicles will begin in about two months. At present 250 omnibuses of the type now in use are being manufactured. Extensions of the Hampstead Tube to Hendon, the enlargement of the City and South London Tube from narrow to standard gauge, and the coupling up of that line and the Hampstead and Highgate line are proposed. To carry out existing unfinished schemes will require an estimated expenditure of £3,000,000. "The crux of the whole question of traffic difficulties in London," said Mr. Peck, "is rolling stock. The hardest thing to buy to-day is a passenger car."

OVERCROWDING OF OMNIBUSES AND TRAMCARS.

In reply to a question by Mr. Higham, the Home Secretary said that he was well aware of the overcrowdiug of omnibuses and tramway cars in London. It had been necessary to allow a limited number of excess passengers to meet the shortage existing by the withdrawal of omnibuses for military use, and by the impossibility of replacing worn out vehicles during the war. The police have temporarily reduced their requirements with regard to the vehicles to the lowest possible point consistent with safety, in order to allow as many vehicles as possible to continue to run. Neither he nor the Commissioner of Police was responsible for the supply of vehicles, but the Commissioner had reason to believe that the operating concerns were doing their utmost to cope with the situation.

CIVILIAN FLYING.

The ban on civilian flying was raised on May 1, and the Air Ministry have published some details of the aerial routes which it is thought desirable to use at first. These are described as the trunk aerial routes, and have been chosen with reference to the situation of existing aerodromes and military demands. An attempt has been made to establish direct communication between London and Ireland, and London and the North, and also to cater for some of the more important centres which lie along the routes. The suggested routes are as follow:—London-Scotland, London-Dublin, London-Manchester-Belfast, a Continental route, a Dutch route, London-Plymouth, and London-Bristol.

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MOTOR TRAFFIC

MOTOR TRAFFIC NOTES.

INCREASED COST OF AMBULANCE RUNNING.—Owing to increased wages, etc., the Metropolitan Asylums Board are charging Poor Law Guardians 1s. a mile instead of 9d. for the hire of motor ambulances.

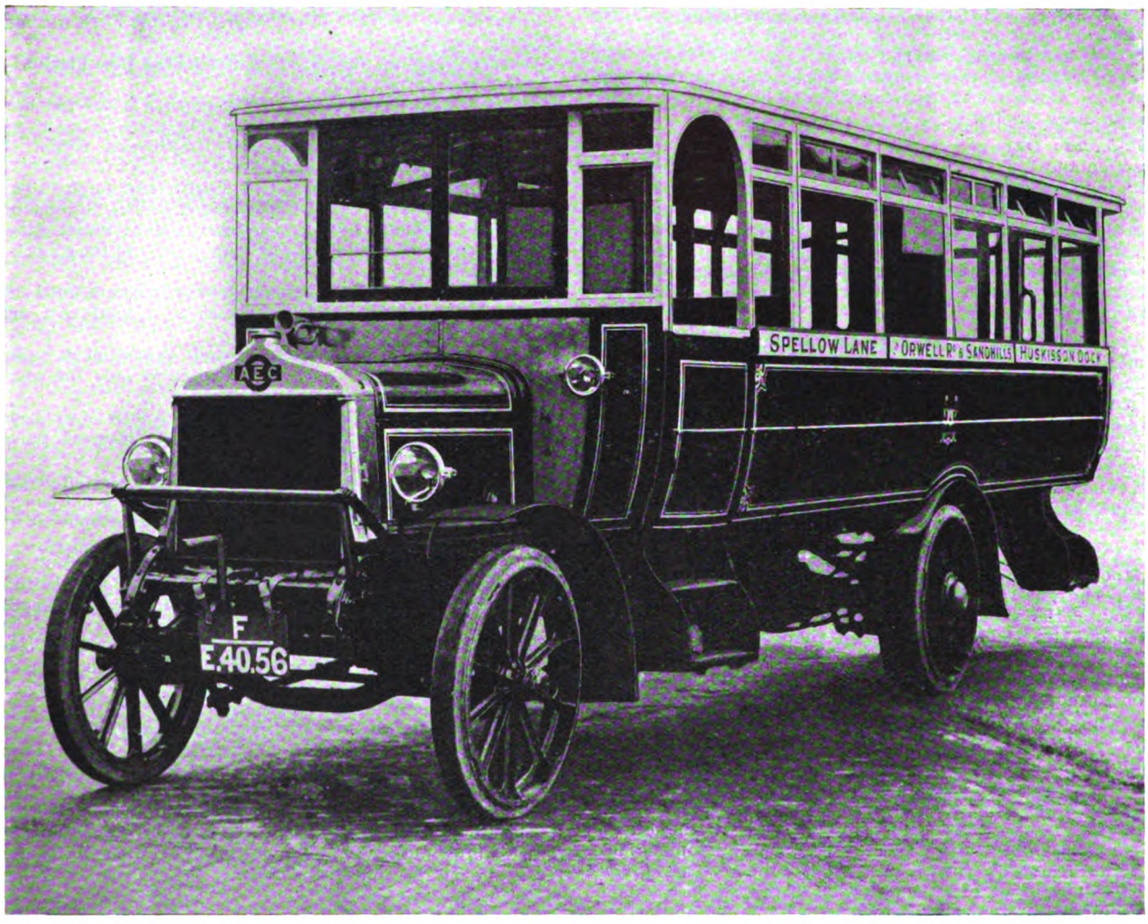
IMPORTATION OF EDISON CELLS.—The President of the Board of Trade on April 23 issued an order removing the restriction on the importation of Edison cells (and component parts) for electrically-propelled vehicles.

THE SOLID TIRE COMMITTEE.—Mr. H. Shankland, of the Shrewsbury and Challiner Tire Company, has been appointed chairman of the Solid Tire Committee of the Society of Motor Manufacturers and Traders for the ensuing year.

restricted and freed imports. The restrictions include the following:—Motor vehicles and accessories restricted to 50 per cent. of 1913 imports until September 1, 1919.

OMNIBUSES AND STREET LAMPS.—Camberwell Borough Council have had correspondence with the Commissioner of Police as to street lamps said to project from the footways and interfere with traffic. The Council contend that any difficulties are caused through the manner in which the vehicles are constructed, and suggest that vehicles with top decks overhanging the wheels should not be licensed.

EASTER OMNIBUS TRAFFIC.—Notwithstanding the increased fares and the greatly augmented number of omnibuses running on the routes, there was more traffic than could be carried during the Easter holidays on the country trips within a thirty miles radius of Charing Cross. Over the London-Croydon tramway route there was a



Single Deck Omnibus Seating 32 Passengers—One of a Fleet ordered by the Liverpool Corporation from the Associated Equipment Company.

EXETER-TORQUAY OMNIBUS SERVICE.—Pending the receipt of more precise information, Exeter Tramways Committee have deferred making recommendations in regard to the running by a company of a motor omnibus service between Exeter and Torquay.

SUNDAY OMNIBUSES FOR TEESIDE WORKMEN.—The difficulties with the Teeside workmen arising from the suspension of the Sunday tramway services were removed by the consent of the Imperial Tramways Company to run a service of motor omnibuses on Sunday solely for workmen.

LEICESTER NEEDS MORE OMNIBUSES.—Before the war Leicester Tramways Committee had arranged to run a motor omnibus service to Syston, by the Thurmaston route, when the Government impressed the omnibuses. The Corporation are now seeking to obtain omnibuses wherewith to start the service.

THE RESTRICTION OF MOTOR VEHICLE IMPORTS.—The new Consultative Council on Imports on April 11 issued, under the authority of Sir Albert Stanley, President of the Board of Trade, a new list of

constant procession of omnibuses running to and from Redhill, Reigate, etc.

LEYLAND OLD CHASSIS REALISES OVER £500.—As evidence of the high prices that are at present commanded by industrial motor vehicle chassis of the best makes, it is interesting to note that at a recent sale conducted on behalf of the Government Stores Disposal Board at the Agricultural Hall, a Leyland omnibus chassis dated 1914 which was not in the best of condition, realised five hundred and eighty guineas.

U.S.A. TRUCK EXPORTS.—A Washington report states that during January, 907 trucks valued at $2,375,584 were exported. This shows an increase of 11 trucks and a decrease in valuation of $261,105 over December, 1918, during which month 896 trucks valued at $2,636,689 were exported. The figures for January, 1919, show a decrease of 249 trucks over January, 1918, at which time 1,156 trucks valued at $3,328,870 were exported. The difference in valuation is $953,286.

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MOTOR TRAFFIC

NEW OMNIBUS SERVICE AT HUDDERSFIELD.—The motor omnibus service recently instituted between Waterloo tramway terminus and Kirkburton has proved a great convenience, not only to the residents in the district, but also to visitors to Storthes Hall Asylum. The service is hourly, and the two omnibuses employed on the route have been fully engaged, especially on Sundays, when there is no train service to Kirkburton.

NO DANGER OF FAILURE OF PETROL SUPPLIES.—No matter how large the demand may be, Sir Marcus Samuel considers that there is not the slightest danger of failure of the petrol supplies. At the present time the storages of the country are full to overflowing, so that it is almost impossible to land a cargo. If the entire supply from the United States were to fail, Sir Marcus says that there is enough petrol in the rest of the world to meet all requirements.

GOVERNMENT BLAMED FOR PETROL PRICES.—Sir Marcus Samuel, the chairman of the petrol combine, has informed the Commercial Motor Users' Association that it was not the fault of the producer or of those who dealt in petrol that prices had been at the level at which they had been maintained for so long. The matter had been entirely outside of their control. Such blame as there was must rest upon Government departments, who seemed to consider it a duty to show profits.

A TIME-SAVING DEVICE.—At the new terminal of the Northern Ohio Traction and Light Company at Akron a feature of the office equipment is the dictagraph interconversing system for talking from office to office direct without connecting through an operator's switchboard. These machines are very sensitive, and conversation can be carried on without talking directly into the transmitter. This eliminates much of the calling through the telephone switchboard, thus saving time in direct office calls and preventing congestion of calls on the city lines.

GERMAN EXPERIENCE OF GAS-DRIVEN MOTORS.—At last year's annual meeting of the German Association of Gas Engineers, the belief was expressed that there would be an increasing demand for gas for road motors. The opinion was expressed that the roof gasholder offers more advantages than any yet proposed system of compressed gas in cylinders. One advantage is the avoidance of weight. Experience in Berlin with 3-ton vehicles shows a consumption of one cubic metre of gas per mile. In London it is difficult now to find a gas-driven car or wagon, despite of the high price of petrol.

HEAVY VEHICLES AND SIDE GUARDS.—Asked whether he would consider the question of compelling heavy motor vehicles to be fitted with side guards, the President of the Local Government Board has stated that the matter was considered by the Departmental Committee on Heavy Motor Cars, and they recommended that further investigations should be made with a view to overcoming the difficulties. As the powers of the Local Government Board in relation to motor vehicles are being transferred to the Ministry of Ways and Communications, further action will be left to the Ministry.

GAS-DRIVEN TRAMWAY CARS.—A New York correspondent of the *Daily Express* reports that Mr. C. E. Scrensen, general manager of the Ford Tractor Company, announces that plans are being completed for the use of gas-propelled tramway cars. One of the designers of the Liberty engine used in American war aeroplanes has gone to Detroit to assist in the demonstration of the new cars, which, it is stated, will begin work over the Detroit Tramways this summer. Mr. Screnson is evidently an optimist on gas traction, and declares that electric tramcars now seen on city streets will soon become things of the past.

ROAD CONSTRUCTION PROGRAMMES.—While to a certain extent the improvement of roads in Great Britain is being held up by controversy as to the roads coming under the authority of the Ministry of Ways and Communications, Canada and the United States are engaging in great schemes of road construction in order to facilitate motor traffic. The Dominion Government recently announced their policy for the building of national highways. What is being done in one State of America may be taken as typical of the road plans adopted in other States. It is planned during the present year to build 3,500 miles of primary roads in Pa., the State paying for the same. The new roads will have concrete foundations.

MINISTERS' MOTOR CARS.—The Chancellor of the Exchequer has stated that before the war it was not the custom to supply ministers with motor cars at the public expense. During the war the position had changed and cars had been supplied to ministers holding the more important offices under the Crown. For the War Office, 43 cars were employed, and their use was restricted to work in connection with public service. The whole question of the use of such cars by ministers or other officials was being considered by the Government with a view to its restriction as far as might be, and to the establishment of a stricter control than had been practicable under the exceptional conditions prevailing during the war.

MOTOR VEHICLES FOR MUNICIPALITIES.

DARLINGTON RURAL COUNCIL have purchased a 5-ton petrol chassis.

LONDON COUNTY COUNCIL TRAMWAYS are obtaining six 4-ton petrol lorries.

WHITEHAVEN COUNCIL are expending £1,157 on purchasing a motor fire engine.

HORNSEY CORPORATION have voted £11,500 for the purchase of six motor vehicles.

MELTON MOWBRAY RURAL COUNCIL contemplate purchasing two steam tractors.

CORK RURAL COUNCIL have bought a motor lorry for haulage of building materials.

WEST RIDING STANDING JOINT COMMITTEE have decided to buy a motor lorry at £1,100.

ESSEX COUNTY COUNCIL are providing a car for the use of the Harold Court Sanatorium.

KEITH DISTRICT COMMITTEE and BRIXWORTH RURAL COUNCIL have purchased steam tractors.

MANCHESTER CORPORATION GAS COMMITTEE have ordered two tipping wagons from the Sentinel Wagon Works, Shrewsbury.

LONDON COUNTY COUNCIL Tramways department are adding six 4-ton petrol lorries of not less than 40 H.P. to their stock of road motor vehicles.

READING TRAMWAYS COMMITTEE have recommended the Corporation to purchase five omnibuses at a total cost, including equipment, of £7,750.

POPLAR COUNCIL have purchased four Government 5-ton steam tipping wagons at £570 each, and expect to save the cost during the first year's working.

GLASGOW CORPORATION have sent a committee to inspect the haulage plant and appliances provided for cleansing purposes at London, Birmingham, and Sheffield.

EDISON ACCUMULATOR COMPANY, LIMITED, are supplying three electric vehicles at £1,304 each to Taunton Town Council. One vehicle will be provided with an interchangeable body at an extra cost of £300.

GLOUCESTERSHIRE COUNTY COUNCIL are purchasing 30 War Office lorries, the county surveyor having reported that great economies would result from motor haulage in connection with road reconstruction.

BIRMINGHAM BUYING ELECTRICS.—The Birmingham Corporation have purchased three electric vehicles for the collection of house refuse at a cost of £1,304 each, and intend yearly to displace horses by the purchase of further vehicles.

OMNIBUSES FOR EDINBURGH.—The Tramways Committee have accepted tenders for 12 motor omnibuses at a cost of £1,431 each, and three chars-a-bancs at £1,341 each from Messrs. Leyland Motors, Limited, Leyland, Lancashire.

PRESTON CORPORATION have appointed a committee to report on the advisability of adopting motor traction, the cleansing superintendent having visited various towns in order to ascertain the respective merits of petrol, steam, and electric vehicles for cleansing work.

LUTON COUNCIL have been advised by the Electricity Committee to obtain an electric 3½-ton wagon from Edison Accumulators, Limited, at £1,607. It is estimated that £400 yearly could be saved by using the vehicle for the removal of clinker from the generating station.

HOME OFFICE AND MOTOR OMNIBUSES.

In the House of Commons, on April 8, Mr. Gilbert asked the Home Secretary what powers his department had over motor omnibuses in London and district, and if they had any control over routes or fares? In reply, Mr. Shortt said that by the Metropolitan Public Carriage Act, 1869, the Secretary of State for the Home Department is given power to grant licences for stage carriages, their drivers and conductors. This power by successive Orders he had delegated to the Commissioner of Police, who caused each vehicle to be inspected and, if found fit, licensed for public use. Interference with the routes of public omnibuses is entirely forbidden by the Metropolitan Streets Act, 1869, but before licensing a stage carriage its fitness for the particular route is considered by the Commissioner. The amount of fares chargeable is in the discretion of the proprietor of an omnibus.

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SATURDAY, MAY 17, 1919.

THE ELECTRICITY SUPPLY BILL.

ON Wednesday the Government introduced the long-expected Electricity Bill to the House of Commons. Everyone is agreed that the present condition of electricity supply in this country is wholly unsatisfactory, and enquiry must be concentrated on the question whether the Government's proposals will form an efficient instrument for the proper organisation of electrical supply or merely act as a palliative, remedying some defects, stereotyping others, and substituting an irksome bureaucracy for the unregulated activity of individual enterprise. Such questions can be answered only when the details of the Bill, and their application to practical problems, have been reviewed, and that time is not yet. Meanwhile, attention may be called to the general scope of the Bill. As stated by the Home Secretary, the main principles are : Electricity Commissioners, not more than five in number, are to be appointed by the Board of Trade to control electricity supply. The Commissioners will divide the country into districts, and constitute for each district an electricity board, consisting of representatives of local authorities, authorised undertakers and consumers of electricity within the district, and labour. Each district board may acquire all public generating stations, including those supplying power to railways, tramways and docks, and main transmission lines within the district, distribution being left in the hands of existing undertakers, subject to review by the district board and the Electricity Commissioners. In acquiring any generating station or main transmission line, the district board must compensate any officer or servant thereby deprived of employment or of salary. Each district board is to provide its own revenue and expenditure, and may borrow money required for purchasing generating stations and main transmission lines, the Electricity Commissioners providing a fund amounting to £25,000,000 for the purpose of advancing the necessary money. In this general outline many important points are necessarily omitted. The terms under which undertakings are to be transferred to the district boards, for instance, must come under the closest scrutiny. Or again, "The prices charged by a district electricity board . . . shall be such that their receipts on income will be sufficient to cover their expenditure on income account (including interest and sinking fund), with such margin as the Electricity Commissioners may allow," and "the Electricity Commissioners may regulate prices with a view to securing that the benefit of any reduction in the cost of electricity . . . shall enure to the consumers." On the latter provision questions will inevitably arise in regard to the degree in which the interests of the consumers of electricity or the producers have to be considered. In fact, the whole Bill will depend for its success upon the ability of the administrators appointed to carry through its provisions and the goodwill of everyone connected, including electricity undertakers, district boards, local authorities, electricity managers and experts, and last, but not least, labour. Backed by enthusiasm—which does not preclude, but includes the keenest possible scrutiny and criticism—the Electricity Supply Bill may be made an instrument which will place the electrical industry of this country in the van of progress.

A LIVERPOOL DEPUTATION CANCELLED.

Some time ago the Liverpool Council agreed to the recommendation of the Tramways and Electric Power and Lighting Committee, that a deputation be sent to United States and Canada to investigate traction systems in view of the fact that Liverpool Corporation must shortly make plans for the extension and improvement of the transit facilities of the City. The minutes of the Tramways Committee contained a recommendation that the Council authorise the payment of the actual disbursements of the deputation in lieu of the sums which would be payable under the usual Corporation scale of travelling allowances.

Sir Archibald Salvidge opposed the recommendation. He pointed out that the usual scale allowed two guineas a day and travelling expenses, but the chairman of the Tramways Committee had volunteered the information that the deputation would cost something like £400 per man. The first proposition of the Tramways Committee was that all members should go, together with certain officials, bringing up the total number to between 30 and 40. The Council had reduced the number to nine, and the tramway manager had intimated his inability to accompany the deputation, owing to urgent needs of the department. Sir Archibald thought that, in these circumstances, instead of asking for unlimited expenses, the Chairman of the Tramways Committee should have abandoned the whole idea. If the whole of the members had gone, as was originally proposed, the deputation would have cost over £15,000, while with the reduced number the expenditure entailed would still amount to £4,600. He asked the Chairman of the Tramways Committee to withdraw the whole proposal.

On being put to the meeting, the recommendation of the Tramways Committee was defeated by an overwhelming majority. In consideration of the almost unanimous opposition of the Council, Alderman Russell Taylor agreed that the resolution sanctioning the deputation should be rescinded.

SHEFFIELD EXTENSION SCHEME.

The Sheffield City Council have approved of an extension scheme in regard to the city boundaries which it is stated, so far as the West Riding County Council is concerned, affects 19 authorities, and includes a population of 71,000 ; 41,000 acres, and a rateable value of £349,000. It is also proposed to include the Borough of Rotherham, the centre of which is six miles from the centre of Sheffield. If the proposal is successful it will mean the merging of the Rotherham Tramways in the Sheffield Tramways, and will also affect in some measure the Mexborough and Swinton Tramway which now join up with the Rotherham Tramway.

Should the whole scheme go through, it will mean that the population of greater Sheffield will be about 640,000. The City boundaries will include practically the whole district within a seven-mile radius from the centre of Sheffield.

Tramcars v. Motor Omnibuses.—Sir William Bull recently expressed the opinion that the days of the tramcar as a vehicle in London were numbered. At a meeting of the London members of Parliament on Monday, he asked Mr. Fell, general manager of the London County Council tramways, whether he thought that the tramcar in London was goint to last, or if in time the motor omnibus would run it off the road. Mr. Fell replied that he thought the streets of London would be absolutely impassible if tramcars were replaced by motor omnibuses. One tramcar would carry the load of five omnibuses. The Council propose to run omnibuses in conjunction with the tramways, the intention being to connect up dead ends.

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L.C.C. TRAMWAY MATTERS.

At the meeting of the London County Council on Tuesday a number of reports were brought up by the Highways Committee, including one on the condition of the tramway tracks, which is summarised below.

LEGAL PROCEEDINGS.—As a result of proceedings, four persons were fined for obstructing the Council's tramcars, two were fined for assaulting conductors, and one for refusing to pay his fare. Proceedings were taken in three cases in respect of the breakdown of defective vehicles on tramway tracks, a fine being imposed in one case, the two other summonses being dismissed. Two persons were fined for spitting on the cars.

COLLECTION OF USED TICKETS.—In a report on this subject in October, 1918, the Highways Committee pointed out that up to that time less than 9 per cent. of the tickets issued were placed by the passengers in the canvas bags, with which all the cars were equipped at the beginning of November, 1918. The result has continued to be disappointing, as less than 10 per cent. of the tickets issued are now collected. An enquiry as to the practice of other tramway authorities in and around London has shown that in five cases no steps are now taken to collect tickets. In three of these cases the decision was arrived at after experiments had been made with the use of bags or boxes in the cars. In five other cases, the amounts collected were 2, 10, 10, 26 and 30 per cent., respectively, of the tickets issued. As the supply of paper has increased considerably, and various restrictions on its use have been removed, the Committee have given instructions for the removal of the bags from the cars.

A long discussion took place on the increase in fares. Mr. J. D. Glibert, M.P., in a vigorous speech, moved the adjournment of the Council by way of protest against the fare changes, which he said were bitterly resented by the public. Sir John Benn seconded, but Mr. Squire's defence of the action of the Council was so satisfactory that on a division, the motion for adjournment was defeated by 67 votes to 41.

CONDITION OF LONDON TRAMWAY TRACKS.

In their report to the London County Council on Tuesday, the Highways Committee stated that they had received several communications from local authorities and private individuals complaining of the condition of the tramway tracks. It had been impossible to adhere to the pre-war standard of track maintenance during the past few years, owing to the shortage of labour and paving material. In addition, a large proportion of the temporary repairs which had been carried out in the worst places had been nullified by the recent bad weather, during which it was not possible to take advantage of the increased amount of labour available. Everything possible was being done to overtake the arrears of work, but owing to the difficulties of obtaining labour and materials some time must elapse before the tracks could be restored to their pre-war condition. About 1,500 men were now employed and further numbers are being engaged as materials become available.

The essential materials required are rails, granite stone setts and wood blocks, and the supply of these is not yet satisfactory. An order for 2,200 tons of track rails was placed on February 15, 1919, and the manufacturers were to arrange to complete the order by the end of this month. So far, however, only about 320 tons have been received. Another firm has had orders for 450 tons, of which 310 tons have been on order since July, 1918, and the remainder since September, 1918, but up to the present it has only delivered about 80 tons. An order for 1,320 tons of conductor rails was placed in February, 1918, but only about 900 tons of this quantity have been received. The manufacturers have repeatedly been asked to expedite delivery, and they have replied that the delay in delivery has been due to war work and labour troubles. The Highways Committee understand that to ensure adequate deliveries a great deal depends upon the railway transport facilities, and they are asking the Ministry of Labour to assist by making representations to the railway executive and taking such other steps as may be possible to expedite deliveries. Long lengths of conductor rails are practically worn out, and unless larger supplies are available immediately, serious delays to traffic will occur. Tenders are at present being invited for further supplies of track rails, and it is hoped that it will be possible to make satisfactory arrangements for future deliveries. In the case of a provincial tramway undertaking, it was found necessary recently to obtain rails from abroad, owing to the inability of British manufacturers to make deliveries within a reasonable time. Granite setts have been scarce during February and March, but consignments are now arriving.

The difficulty of obtaining wood paving blocks is continuing to cause delay. During the war the supply had to be confined to English-grown timber, of which only small quantities were available for street paving purposes. Contracts have, however, now been made for the supply of about 600,000 blocks, some of which are to be of imported deal. Where the materials are in sufficiently good condition the existing paving is lifted and re-laid, but this is, of course, only a temporary expedient, and many places cannot as a rule be dealt with even temporarily by these means.

A Transport Congress.—The County Councils Association have arranged to hold a Road and Transport Congress and Exhibition at the Agricultural Hall, Islington, in November.

LONDON TRAFFIC CONDITIONS.

A further meeting of London members was held at the House of Commons on Monday evening, to consider the problem of traffic congestion and also the recent increase in fares. Representatives from the London County Council and Metropolitan Railway attended.

Mr. W. J. Squires, chairman of the Highways Committee of the London County Council, said that last year 636,000,000 passengers were carried. Parliamentary sanction was now being asked for a scheme for additional tramways and for linking up dead ends at termini. Owing to lack of materials, a considerable number of cars had been kept off the road. There had been an enormous rise in working expenses, the cost per car mile having risen from 6½d. in 1913-14 to 1s. 3d. This had necessitated a revision in the scale of fares, but they were still within the statutory maxima fixed a few years ago. They were carrying workmen 28 miles for 5d.

The main causes of overcrowding on the tramways were the increased number of passengers and the reduction in the number of cars available. The recent changes in working hours had involved a reduction in the number of passengers travelling in the early morning, which had put a greater strain on the tramways during certain periods of the day. They had in working order 1,174 cars and 114 trailers, but it was anticipated that at the end of May 70 additional cars would be placed in service.

Mr. A. L. C. Fell, the general manager, stated that the increase in fares amounted to about 33 per cent., although in some cases it was more. The increase was not intended to be permanent, but a reduction will depend upon the cost of labour and material. In reply to a question by Sir William Bull, Mr. Fell said that the streets in London would be absolutely impossible if tramcars were replaced by motor omnibuses. One tramway car would carry the load of five motor omnibuses in wet weather. They could put on 300 more tramcars at present if the vehicles were available.

Mr. R. H. Selbie, general manager of the Metropolitan Railway, gave much information in regard to the traffic on that line, and said that an experimental train was being built, which would have five doors to a carriage on each side, which would enable the passengers to unload themselves instantly. Alluding to the increase in cost Mr. Selbie said that coal had increased by 78 per cent., and other materials by 80 per cent., while the weekly wages bill was 129 per cent. higher than in 1913. The average weekly earnings of employees was £3 8s. 7d., as against £1 13s. 1d. in 1913.

THE INTERNATIONAL TRAMWAYS UNION.

REORGANISATION AFTER THE WAR.

President M. C. de Burlet, and the General Secretary, M. H. Camp, of the Permanent International Tramways Union, have sent out from the general offices, Rue d'Arlon 23, Brussels, a circular explaining to the members the condition of affairs owing to the interruption caused by the war. The offices have been maintained and activity, necessarily very restricted, has been carried on. In order to meet the present condition they propose that the Union should be wound up, and a new Union formed at once, consisting of members representing allied and neutral countries. It is proposed that subscriptions shall be paid for the years 1918 and 1919, in order to provide the necessary funds to carry on the work of the organisation. Alluding to the great changes in the tramway and light railway industry effected by the war, they point out the special importance in these circumstances of the international exchanges of information.

MISCELLANEOUS NEWS AND NOTES.

Repairs at Derby.—It is estimated that the necessary repairs to the tramway track will cost about £50,000.

Deficit at Darlington.—There has been a loss on Darlington Corporation Tramways of £1,761 during the past year

I.M.E.A. Annual Convention.—The dates of this convention have been altered to June 18, 19 and 20, owing to difficulties in connection with catering, etc.

Trolley Wire Falls on Car.—On May 12, while a Bristol tramcar was approaching Lawrence Hill station, an overhead trolley wire broke and fell among the passengers on the upper deck of the car. Three passengers suffered slight injuries.

Electrification of Jamaica Railways.—The *Times* correspondent of Kingston reports that the Government has a scheme under consideration for the electrification of the Jamaica railways, A sum of £1,000 is being spent on an inquiry. It is proposed to utilise water power, of which there is an abundance in the island.

Liverpool Women Conductors Displaced.—Early in May, Liverpool Corporation dispensed with the services of women in the tramway department. There were altogether 1,500 females in the service, mostly tramway conductors, and now their places have been taken by men demobilised from the fighting forces of the Crown.

Standing Up for the Engineer.—As a protest against the rejection by the Council of their recommendation increasing the salary of the electrical engineer, all the members of the Electricity Committee of Bridlington resigned, and subsequently refused to reconsider their action.

When is a Workman :—Dundee Corporation Tramways Committee has decided that the privilege of workmen's fares should be extended from 7 a.m. to 7.30 a.m. Birkenhead Town Council Tramways Committee, on the other hand, has decided that the issue of workmen's tickets be stopped at 7.30 a.m., instead of 8 a.m., as at present.

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Omnibus Fares.—In the House of Commons on Tuesday, Mr. Shortt, in reply to a question by Mr. Higham, said that an investigation into the increase in omnibus fares was now proceeding, and would necessarily occupy some time. He had no power to order a reduction in the fares. If fares were found to be excessive, it would have to be considered in what manner the Government should proceed.

"Protection" for Tramways.—The Tramways and Streets Committees of Exeter County Council recommend the Council to attach a number of conditions to their approval of the proposed motor omnibus service between Exeter and Torquay. Among other conditions, they require that no omnibus passenger be taken up and set down within the limits of the city, that the minimum fare be 6d. for all passengers on the omnibuses, and that certain specified streets be excluded from the omnibus routes.

St. Helens Corporation Tramways.—St. Helens Tramways Committee have decided to purchase thirty-six tramway cars from the company. The Corporation will take over the working of the tramway service in September. As reported in our last issue, Mr. L. C. Bellamy has been appointed manager of the undertaking. The salary is £400, rising by annual increments of £25 to £500. The Tramways Committee propose to make application to the Board of Trade for sanction to borrow £25,000 for tramway purposes.

Hull Tramways Committee Dismissed.—At a special meeting of Hull City Council, held on Monday May, 12, Mr. Digby Willoughby moved: "That the resolution passed by the Council on the 9th November, 1918, appointing the members of the Tramways Committee until the 9th day of November next be rescinded, and that a committee consisting of twelve members (in addition to the Lord Mayor and ex-Lord Mayor ex-officio) be appointed to have the management and control of the tramway undertaking of the Corporation." After discussion, the resolution was carried by 24 votes to 4.

Petrol Supply.—Complaints have been made in the House of Commons of the inferior quality of the petrol now being sold to motorists. Mr. Bridgeman, in reply, said that the price of petroleum products had been so fixed as to balance as nearly as may be the cost to the Government after allowing for freight payments. All importations of petrol up to January 31 were on Government account, and the qualities imported were of the standard U.S. specification. The petroleum companies since that date have been free to import on their own account, and the sale of petrol is in their hands.

Lanarkshire Tramways Strike Ended.—A conference was held in London between officials of the Lanarkshire Tramways Company and representatives of the Tramway and Vehicle Workers' Association, at which a basis of agreement was arranged. This arrangement was discussed at a meeting in Motherwell by the representatives of the workers and the tramway company, and ratified. By the terms of settlement, the permanent-way men and shed employees are to be reinstated, and about 150 of the traffic operators resume work at once, the remainder to be restarted as soon as possible. Women inspectors are to be given employment either as drivers or conductors. The case of the motor-woman dismissed is referred to arbitration, Sir Thomas Munro being appointed referee. In addition, the management of the company has undertaken to institute enquiry into other outstanding matters of grievance.

Higher Fares at Liverpool.—Liverpool City Council, on May 9, accepted the recommendation of the Tramways Committee that, in consideration of the additional expenditure caused by the reduction of working hours of the tramways employees, and the increased cost of materials, the revised scale of fares recommended by the general manager on the basis of a stage of 1½ miles for 1d. and the consequent modification of the other stages be approved. Strong opposition was offered to the proposal, but Alderman Russell Taylor, chairman of the Tramways Committee, submitted figures showing that the estimated revenue for 1919 was £1,119,000, leaving a deficit of £81,942. The increased cost of labour, material, etc., for 1919, as compared with 1913, the year immediately prior to the war, was £639,964. On these figures, he thought the committee was justified in asking for increased fares. A vote was then taken, and the recommendation was carried by 47 votes to 24.

Electric Vehicles.—The paper read by Mr. Frank Ayton, honorary secretary of the Electric Vehicle Committee of Great Britain, and general manager and electrical engineer of Ipswich Corporation tramways, on "The Electric Automobile for Commercial Use" at the Royal Automobile Club on Wednesday, was an interesting résumé of the present position of the electric vehicle, briefly describing the development in America and giving at greater length an account of the progress already made in this country. Mr. Ayton thinks that a careful consideration of the characteristics of the commercial electric must inevitably lead to the conclusion that its main field and application lies in substitution for horse haulage. It does not and cannot compete with the petrol vehicle where the latter is employed upon the work for which it is so well suited, viz., long distance haulage and express service. In reply to a general discussion on the paper, Mr. Ayton admitted that his chief interest in electric vehicles was due to the fact that the charging of batteries during the night would be profitable business for electricity supply stations. On the other hand, a number of the members of the Electric Vehicle Committee were thoroughly convinced of the great value of electric vehicles within certain limits.

New Tramcars for Bradford.—Alderman Priestley and Councillor I. F. Ackroyd, chairman and deputy chairman of Bradford Tramways Committee, have been authorised to order twenty-six new sets of car motors, fitted with the Spencer-Dawson patent oil brake. Messrs. Dick, Kerr and Company, who are building twenty-six new cars for Bradford Tramways Committee, hope to begin delivery by the end of June, and to complete the order by August. These cars will greatly assist the Tramways Committee in handling the traffic; but even when all the cars are delivered the services will not reach the pre-war level, as they will only replace cars now in use, but which are worn out. The new cars will have greater power than the old cars, and will be provided with the Spencer-Dawson brake.

FINANCIAL.

Colne Corporation tramways department shows a loss for last year of £3,004. This sum was considerably larger than the estimated deficit, and the excess is attributed to the increase in wages and higher cost for energy.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended May 14 amounted to £82,685, an increase of £22,620 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1st (the commencement of the financial year) to May 14 (six weeks and two days) the total receipts were £489,385, an increase of £132,223 on the corresponding period of 1918.

Hadfields, Ltd.—Following on the increase of capital to £2,000,000 by the creation of 1,300,000 ordinary shares of £1 each, the directors of Hadfields, Ltd., have decided to issue 800,000 of these shares as fully paid in the proportion of two new shares for every share held; 400,000 additional shares are offered to shareholders in the proportion of one new share for every share held, at 30s. per share. The right of renunciation is given and the allotment letters can be split.

Bournemouth and Poole.—The annual report of the general Manager of Bournemouth Municipal Tramways shows that the revenue for the year was £148,449, an increase of £16,776 over the previous year. The surplus has also increased from £26,329 to £31,950. On the other hand, the operation of the Poole section of the system shows a deficit of £8,462, and Mr. Bulfin, the general manager of the Tramways Department, anticipates that "in the coming year, under present conditions, this loss will be considerably increased." Poole Corporation refuses, in face of every argument, advanced by the Tramways Committee of Bournemouth, to allow an increase of fares on the route under their authority.

London and Suburban Traction Co.—The directors in their report for the year ended December 31, 1918, remark that the continuation of war conditions has intensified the difficulties of the company's undertakings. Shortage of labour and the difficulty of obtaining material has caused a reduction in the number of cars in service, while the operating expenses have increased as a result of additional wages and higher cost of fuel. In consequence of the decrease in dividends received from the subsidiary companies, and to the Tramways (M.E.T.) Omnibus Company finding it necessary to make provision for an early renewal of its fleet, the directors are unable to recommend the payment of any dividend on the preference shares. The gross revenue for the past year amounted to £46,294, as compared with £81,519 for 1917. After deducting all expenses, including debenture and loan interest, and providing for the sinking fund charges on the 5 per cent. debenture stock, there remains a balance of £3,458, making, with £3,634 brought forward, a total of £7,092, which is carried to the next account.

PERSONAL.

Mr. C. R. Everson, manager of the Plymouth Corporation tramways, is shortly to retire on a pension.

Mr. J. B. Horner, traffic superintendent of Wigan Corporation tramways, has been granted an increase in salary of £50 to £250.

Nelson Town Council has increased the salary of the electrical engineer and tramways manager, Mr. G. E. Nayler, by £100.

Mr. Charles Challenger has resigned the position of manager of the Bristol Tramways and Carriage Company, and has been invited by the directors to join the board.

Mr. S. C. Tranter, relief charge engineer of the London County Council tramways, has been appointed charge shift engineer, at a salary of £250, rising to £300.

Mr. F. R. Fearnley, general manager of Sheffield Corporation tramways, has been given permission to assist London County Council in connection with their motor omnibus proposals in their Parliamentary Bill.

Mr. F. C. Raphael has been appointed manager of the cable and wire department of the Edison-Swan Electric Company, Ltd., on his release from the Army. Shortly after the outbreak of war he joined the Royal Naval Anti-Aircraft Corps, but in February, 1916, he obtained a transfer and a commission in the London Electrical Engineers.

The Mirrlees Watson Company, Ltd., of Scotland Street, Glasgow, have issued their circular No. C1,000, describing the Mirrlees tube-cleaning apparatus for surface condensers. This apparatus is made in six sizes for cooling surfaces ranging up to 12,000 ft. Once fitted the apparatus forms a permanent adjustment and thereafter the end covers of the condensers need never be removed for cleaning purposes. The apparatus is simple, and it affords the great advantage of reduction in the time required for cleaning.

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CONTRACTS AND ORDERS.

Bolckow, Vaughan and Company, Ltd., have received an order for 200 tons of tramway rails, B.S.S. No. 2, from Exeter Corporation.

Johnson and Phillips, Ltd., are supplying sub-station switchgear to Hackney Borough Council. The amount of the order is £7,183.

Overhead System Accepted by Stepney.—By a resolution passed at the recent meeting of Stepney Borough Council, a veto has been removed which obstructed the development of the London County Council Tramway system through Stepney, Poplar and Bethnal Green. For a long period, Stepney Borough Council has held out for the installation of the conduit system in Burdett Road, and the London County Council offered instead the overhead wire system of traction. Stepney Council has now accepted the latter offer and removed its veto.

POSITIONS VACANT.

COUNTY BOROUGH OF ROTHERHAM.

Appointment of Tramways Manager.

The Rotherham Corporation invite applications for the post of Tramways Manager.

Applicants must have had experience of tramway management and possess kn. wledge of tramway engineering.

Preference will be given to an ex-service man.

Salary £500 per annum inclusive.

Applications, stating age, present occupation, qualifications and previous experience, accompanied by copies of not more than three recent testimonials, and endorsed "Tramways Manager," should reach me not later than the 28th instant.

Canvassing either directly or indirectly will be deemed a disqualification.

CHAS. L. DES FORGES,
Town Clerk.

Town Hall, Rotherham,
May 14, 1919.

TO TRACTION ENGINEERS.

A large Electrical Manufacturing Concern has a vacancy for an Engineer with long experience of heavy electric traction control, to take full charge of the designing and draughting departments for this class of work. Only thoroughly capable men need apply, and the position, which is permanent, is sufficient to attract a man of high ability.

Applications should include a full statement of the designing and manufacturing experience of the applicant, together with his technical and practical training, date services available, and salary required to Box No. 58, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

PERMANENT WAY ENGINEER.

Permanent Way Engineer is required to act as Foreman during construction of extensions.

Applicants must have good experience in the laying down of new track.

Applications, stating wages required, must be sent to General Manager, J. C. Whiteley, Dean Road, South Shields, on or before May 30, 1919.

Bolts and Nuts.

Advertisers, being constant buyers, are desirous of coming to an arrangement with firm of repute regarding representation in London —Head Warehouse Room.—Box No. 60, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, W.C.2.

WANTED.—Wheel Press, 50 to 75 tons, 12 in. ram stroke, 2 tension bars, hand power, to take from 36 in. to 42 in. between tension bars.—Particulars and price to Springvale Engineering Works, Blythe Road, W.14.

THE
ENGLISH ELECTRIC COMPANY
LIMITED.

Queen's House, Kingsway, London, W.C.2.

This Company, with a Capital of £5,000,000, has been formed to consolidate under one direction and management the various interests of the following companies, in all of which a predominating control exists:—

COVENTRY ORDNANCE WORKS, LTD.
DICK, KERR & CO., LTD.
PHŒNIX DYNAMO MANUFACTURING CO., LTD.
UNITED ELECTRIC CAR CO., LTD.
WILLANS & ROBINSON, LTD.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C. ..	Apr. 22	460	769	+ 309	8	1,880	—
Aberdeen Corporation ..	May 7	2,268	3,094	+ 826	49	128,584	+ 21,809
Ayr Corporation ..	„ 10	449	561	+ 112	50	29,256	+ 6,187
Birkenhead Corporation	„ 11	2,099	2,427	+ 328	53	14,053	+ 2,006
Blackburn „ ..	„ 8	1,672	2,157	+ 485	64	14,352	+ 3,976
Bradford Corporation .	„ 10	7,461	10,807	+ 3,346	6	64,211	+ 19,258
Burnley Corporation .	„ 10	2,110	2,994	+ 884	..	..	.
Burton-on-Trent Cor. .	„ 11	383	464	+ 81	6	2,675	+ 447
Bury Corporation ..	„ 11	1,974	2,306	+ 332	67	14,349	+ 3,783
Chatham & District ..	„ 8	1,301	1,567	+ 266	18	22,650	+ 2,079
Cork Electric	„ 8	618	683	+ 65	18	10,195	— 624
Derby Corporation ..	„ 10	1,461	1,571	+ 110	6	9,420	+ 1,101
Dundee City	„ 7	1,590	2,211	+ 621	51	101,436	+ 21,227
East Ham Corporation ..	„ 10	1,398	1,954	+ 557	52	10,712	+ 3,245
Glasgow Corporation ..	„ 10	28,385	32,196	+ 3,811	49½	1,423,984	+ 110,177
Glossop (U.E. Sup. Co.) ..	„ 10	182	227	+ 45	19	4,171	+ 778
Halifax Corporation ..	Apr. 29	2,643	3,071	+ 428	4½	14,832	+ 4,028
do. Motor Buses ..	„ 29	56	71	+ 15	4½	335	+ 95
Huddersfield Corporation	May 10	3,481	4,711	+ 1,230	6	28,392	+ 7,298
Ilford U.D. Council ..	„ 10	935	1,242	+ 307	6	6,742	+ 1,342
Ipswich Corporation ..	„ 10	683	847	+ 164	6	4,645	+ 601
Isle of Thanet ..	„ 10	215	768	+ 553	32	12,586	+ 6,725
Kilmarnock Corporation	„ 10	239	316	+ 77	51¾	13,907	+ 2,994
Lanarkshire	„ 8	3,463	1,881	— 1,582	18	55,979	— 4,966
Leeds City	„ 10	11,454	16,072	+ 4,618	6	94,374	+ 30,437
Leicester Corporation ..	„ 10	4,481	5,871	+ 1,390	..	..	..
Leyton U.D. Council ..	„ 8	2,033	2,993	+ 960	6	17,614	+ 6,141
Liverpool Corporation ..	„ 10	18,424	22,559	+ 4,135	18½	386,931	+ 72,905
Llandudno & Colwyn Bay	„ 2	338	483	+ 145	22	7,522	+ 1,544
London County Council ..	„ 14	60,065	82,685	+ 22,620	6¾	489,385	+ 132,223
Maidstone Corporation ..	„ 8	268	352	+ 84	5¾	2,129	+ 510
Manchester Corporation	„ 10	25,382	30,465	+ 5,083	6	175,138	+ 36,702
Newcastle-on-Tyne Cor.	„ 3	8,749	8,730	— 19	5	43,073	+ 2,227
Northampton Cor. ..	„ 2	900	1,170	+ 270	5	5,729	+ 1,428
Nottingham Corporation	„ 8	5,693	7,185	+ 1,492	6	38,601	+ 8,550
Oldham Corporation ..	Mar. 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation ..	May 7	1,234	1,559	+ 325	5¾	8,217	..
Rhondda Tramways ..	Mar. 20	1,633	2,150	+ 517	11	23,210	+ 5,603
Rotherham Corporation	May 14	2,043	2,261	+ 218	6¾	14,531	+ 1,608
Sheffield Corporation ..	„ 1	13,568	16,446	+ 2,878	6¾	113,224	+ 24,546
Southampton Cor. ..	„ 7	2,498	2,674	+ 180	5¾	14,163	+ 10 23
Southend-on-Sea Cor. ..	„ 30	730	1,424	+ 694	5	7,259	+ 4,000
South Shields Cor. ..	„ 26	1,059	1,601	+ 541	4	5,858	+ 1,419
Sunderland Corporation..	May 11	2,092	2,708	+ 616	6	16,674	+ 4,279
Swindon Corporation	„ 7	324	303	— 21	5½	1,796	+ 225
Torquay Tramways .	„ 1	847	949	+ 102	17	13,979	+ 1,575
Tyneside Trys. & Trmrds.	Apr. 23	908	1,618	+ 710	17	14,526	+ 304
Wallasey Corporation .	May 10	1,744	2,456	+ 712	5¾	13,996	+ 4,274
Walsall Corporation ..	„ 10	1,194	1,384	+ 180	6	8,295	+ 1,350
Walthamstow U.D. Coun.	„ 10	1,412	1,827	+ 415	6	10,391	+ 3,037
Warrington Corporation	„ 1	741	865	+ 124	4	4,047	+ 817
West Ham Corporation	„ 8	4,150	5,535	+ 1,385	5¾	29,244	+ 7,206
Wigan Corporation .	Jan. 2	2,357	2,424	+ 77	30	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Belfast, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding)

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	May 6	£59,028	£56,085	18	£1,040,152	+ £43,450
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Mar.	3,803	3,051	48	42,131	+ 1,444
Brazilian Traction (Mrs.)	Mar.	8,094,000	9,230,000	13	25,824,000	+ 2,578,000
Brisbane	Apr.	35,530	38,775	17	151,110	+ 13,541
British Columbia .. $	Mar.	510,892	649,120	39	5,390,119	+ 894,648
Buenos Aires Lacroze ..	Apr.	41,643	43,607	43	434,186	+ 46,122
Burmah Tram. & Light Rs.	Mar. 31	27,906	38,440	34	289,170	+ 77,029
Calcutta .. .. Rs.	May 3	75,438	83,269	17½	1,494,010	+ 208,647
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Apr	4,2 0	1,786	17	10,192	— 7,366
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	Apr.	1,791	1,920	39	17,548	+ 5,261
Hong Kong.. .. $	Mar. 22	12,283	13,945	12	172,169	+ 6,141
Kalgoorlie	Jan.	2,522	2,562	4	2,562	+ 40
La Plata	Apr.	5,169	5,630	17	23,650	+ 3,677
Lima	Feb.	41,921	46,082	8	91,444	+ 5,962
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Apr. 30	42,911	44,766	17	271,568	— 49,156
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	+ 43,959
Manila .. .. $	Mar.	172,750	207,792	13	650,745	+ 142,995
Montevideo	Apr.	33,704	37,014	26	227,905	+ 21,868
Para	Mar.	24,848	26,022	17	97,585	+ 3,164
Pernambuco	May 11	4,302	5,806	18½	101,175	+ 14,167
Peruvian .. .. $	Feb.	925,410	943,470	34	7,973,835	— 229,195
Port Elizabeth	Nov.	3,807	3,198	..	..	..
Rangoon	Apr.	5,855	6,217	17	25,817	+ 2,954
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore .. .. $	Mar. 15	14,161	16,307	11	178,525	+ 31,018
Toronto .. .. $	Mar.	1,113,472	1,083,285	13	3,205,922	+ 42,198
Winnipeg .. . $	Mar.	307,289	384,937	13	1,146,638	+ 205,808

WANTED.

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THE
Tramway AND Railway World

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SATURDAY, MAY 24, 1919.

TRANSPORT ENTERPRISE HELD UP.

If ever there was a period in the history of British transport enterprise when the virtue of patience was at a premium, it is the present time. In all directions there are delays which hinder and uncertainties that paralyse activity. The consequences of a devastating war present difficulties of more than sufficient magnitude to daunt all save the most ardent and optimistic. Scarcity of raw materials, dislocation of transport facilities, disorganised industry, and rampant discontent among the workers, unappeased by higher wages and shorter hours, present problems common to all branches of British industry and commerce, but Parliament has laid upon transport enterprise hindrances still more onerous. The Royal Commission of Enquiry into Coal Mining, the Ways and Communications Bill, and the Electricity Bill are all on the way, and the Cippenham enquiry still drags out its weary length. Whether the mines are nationalised or the mining industry is organised on a basis of compromise between conflicting theories and interests, fuel consumers are faced with the certainty that the price of coal is likely to be permanently high, and the uncertainty of the amount of increase and the continuity of supply. Under the Transport Bill, the status of every railway, tramway, road, and dock authority and undertaking will be changed, but no one yet knows how far and in what directions the alterations will go. Consequently, all transport undertakings, whether owned by municipalities or companies, whether by road or by rail, are in a position of uncertainty which paralyses activity for all excepting those in desperate need. Then there is the Electricity Bill with its comprehensive sweep, taking in all the electrical generating powers of the country, proposing to bring under collective control the whole of the public electricity supply. Owners of electricity undertakings naturally ask themselves what is to be their future position before embarking on any new enterprise, or even extending and improving the powers they already possess. On the other hand, many municipalities and companies in charge of transport facilities feel themselves under the compulsion of a necessity that knows no law. Birmingham, for instance, is going forward with a tramway scheme involving the expenditure of over half a million pounds sterling. Hull is preparing estimates for expenditure of over £100,000, and Liverpool, Manchester, Edinburgh, Dundee, Glasgow, and a dozen other municipalities, not to speak of London, with its immense transport problems, are straining at the bonds, invisible yet paralysing, which hinder their activity. It is high time that the whole transport position was cleared up, and the men in charge of the vast undertakings, upon which so much depends, were freed from the hindrances and uncertainties at present impending. The legislative machine must be both quickened in movement and restricted in scope. We are at present too much under the spell of the oratorical legislator, who mistakes the rounded period for the completed scheme, and imagines that fine words can change hard facts. It is possible to admire the fine proportions of the legislative structures which are now abuilding, and yet to feel a strong and irresistible impatience with the delays they are causing to humbler and more urgently necessary edifices and operations. The present situation has become intolerable, and something must be done at once to clear the way for the immediate development of transport enterprise. Let the Government cut down its proposals to essentials, and get them passed through Parliament without delay. By that means the element of irritating and confusing uncertainty at least would be removed, and men would be able to get to work in the clear light of day.

LONDON TRANSPORT DIFFICULTIES.

Dr. Addison, President of the Local Government Board, received a deputation of London M.P.'s at the House of Commons, on Monday, who laid before him their views on London traffic congestion. The deputation consisted of Sir H. Samuel, Sir W. Bull, Mr. Higham, Lieut.-Col. Archer-Shee, Mr. J. D. Gilbert, Mr. Kennedy Jones, Mr. H. G. Purchase, and Mr. Clem Edwards.

Sir Harry Samuel said that the deputation was concerned only with an effort to get decent and cheap transport in London. It was absolutely necessary, in order to relieve the congestion of central London, that there should be moderately cheap transport, and the success of any housing scheme was dependent on cheap and easy transport.

Mr. J. D. Gilbert stated that the London members had had before them representatives of the Tube and Underground railways, and had obtained a good deal of information. The evidence showed that the railways to the suburbs had increased their fares by 50 per cent. on all routes, and that the season ticket rates had twice been raised. Fares on tubes, omnibuses, and tramways had been increased, and in South London what was a penny fare a month ago had now become twopence. There should certainly be some control over fares.

Colonel Archer-Shee urged that relief measures were necessary at once, and permanent measures could be considered afterwards. The Government had something like 60,000 motor lorries for sale, and steps should be taken to relieve the situation by utilising these vehicles as a temporary measure.

Mr. Clem Edwards said the overcrowding was appalling. There was not an evening when, between Westminster and Barking, there were not between 30 and 40 cases of fainting in the carriages and cars.

Dr. Addison, in his reply, said he was certain the position had not been exaggerated. He thought there were serious possibilities of public annoyance boiling over. He did not see why some of the Government lorries should not be used as a temporary emergency. The suggestion of a Select Committee seemed to him a very practical one, and he thought there should be an interim report dealing with the ameliorative measures necessary to relieve traffic congestion; the Committee could go on with their more detailed enquiry afterwards. The whole position showed how lamentable was the lack of a transport authority to deal with these things. He would pass on the suggestions to his colleagues, and recommend them for adoption.

Rails for Burton-on-Trent.—The Public Works and Tramways Committee of Burton-on-Trent have received a report from the Tramways Engineer that he had purchased 300 tons of rails and 10 tons of fishplates for tramway purposes.

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NEW CLAUSE IN TRANSPORT BILL.

COMPENSATION TO AFFECTED UNDERTAKINGS.

Discussion of the Bill to establish a Ministry of Ways and Communications was resumed in Committee on Thursday, May 22nd. Mr. Shortt moved a new clause dealing with claims against and by the Minister in respect of the exercise of his powers. Mr. Shortt said that the proposals aimed at securing uniformity in dealing with any claims brought by owners of undertakings, and for that purpose the Railway and Canal Commission was provided as a tribunal. The clause was designed so that it not only provided for the payment of compensation to undertakings which had depreciated as a result of the action of the Ministry, but also for payment by the undertaking to the Minister in case of enhancement of value due to the action of the Minister. If the Minister spent money which resulted in enhancement of the value of an undertaking, the owners would be required to pay equivalent compensation to the Minister. It was further proposed that the value should be based on a revenue-earning basis. There were two provisos. The first provided that no claim in respect of any loss alleged to be due to any direction issued by the Minister should be entertained if the direction was issued with the concurrence of the owners of the undertaking. The second proviso was for the protection of the Treasury, and provided that, in the case of an undertaking having been enhanced in value by the action of the Minister, the owners should not be entitled to go to the tribunal and claim that the undertaking should be valued on its enhanced basis.

An amendment, moved by Mr. Neal, providing that account should be taken of the natural growth of traffic on a railway which had not, before being taken over by the Government, paid a dividend of 4 per cent., on its ordinary capital, was accepted.

L.C.C. TRAMWAY MATTERS.

QUARTERLY REPORT OF THE HIGHWAYS COMMITTEE.

The Highway Committee of the London County Council have reported that the action they have taken during the three months ended March 31, 1919, included, among other items, the following:—

EXPENDITURE SANCTIONED.—Purchase of articles for tramway maintenance purposes and the execution of small works and repairs, £58,728; purchase of metals, £2,767; purchase of timber, £2,583; purchase of 500 field coils, £3,302 16s. 3d.; purchase of 58 tons of cotton-covered copper wire, £8,910; rewinding of armatures, £3,500; purchase of 500 car body bolsters, £2,437 10s.; purchase of 50 tons of pulp middles, £1,850; purchase of 400 commutators for electric cars, £3,500; and purchase of bronze bearings, £8,602 1s. 8d.

TRACK RAILS.—Arrangements have been made for the invitation of tenders for alternatively 2,000 tons and 4,000 tons of track rails, with the necessary fish plates.

CLAIMS IN RESPECT OF ACCIDENTS.—767 claims have been settled at an aggregate cost of £5,402.

GREENWICH POWER STATION.—The Committee has sanctioned payment of a bonus of £1,500 to the British Westinghouse Electric Company, Ltd., on the steam consumption under the terms of their contract in respect of two turbo-generators erected by the company.

TRAMWAY MAP AND GUIDE.—An expenditure of £660 was sanctioned for the further issue of 500,000 copies of the tramways map and guide.

DEMOBILISATION.—An arrangement has been approved under which a specially selected official in the tramways department will give personal attention to all cases of disabled men returning from war service in order to facilitate their return to their former position, or to such suitable positions as can be found for them either in the tramways department or in other departments of the Council's service.

COAL SAVING BONUS.—Coal saving bonuses of £1,614 and £1,077 for the quarters ended September 25 and December 25, 1918, respectively, have been distributed among the employees in the tramways department.

MISCELLANEOUS NEWS AND NOTES.

Electrification of Montreal Harbour Railways.—It is reported that the Harbour Commissioners are considering the electrification of the railways on the harbour front.

Conductor's Petty Pilfering.—A conductor on the London County Council Tramway service has been fined £3 with costs, for issuing used tickets to passengers.

Electric Vehicles for Bristol.—The City Engineer of Bristol, in consultation with the City Electrical Engineer, has recommended that six electric lorries be obtained for the work of the Sanitary Committee.

Whitley Council for the Tramway Industry.—At a meeting of the Municipal Tramways Association in London on May 16, the revised constitution for a Joint Industrial Council for the tramway industry was approved.

Increased Fares at Douglas.—The Isle of Man Legislature has authorised the Douglas Corporation to increase the fares on their tramways by 50 per cent. During the war the tramways made a loss of over £12,000.

Corporation Blocks its Own Tramway.—Owing to the breakdown of Chesterfield Corporation's steam roller in Holywell Street, Chesterfield tramway track on that route was blocked for nearly a whole day last week.

Birmingham Tramway Bill.—By a unanimous vote the Town Council have approved the recommendation of the Tramways Committee in favour of the adoption of the new Tramway Bill. This will involve an expenditure of £650,000

L.C.C. Tramway Fares.—It is stated that the London County Council Highways Committee have referred the question of the inequality in some of the tramway fare stages, in regard to which there have been many complaints, to the general manager for further consideration.

Surbiton Opposes L.C.C. Omnibuses.—Surbiton District Council has decided to urge Surrey County Council to oppose the London County Council Tramways Bill, on the ground that any new omnibus routes to be established in the district should be subject to the statutory provisions now in force.

New Cars for Manchester.—At a meeting of Manchester City Council, on May 21, Alderman Chapman, deputy chairman of the Tramways Committee, said that they hoped to provide one hundred more tramway cars this year. Each of these would cost over £2,000. In pre-war times similar cars would have cost about £800.

No Priority for Rolling Stock.—In reply to a question in the House of Commons by Mr. Gilbert, as to whether he could make any arrangements by which traffic authorities or companies in London might obtain special priority for the supply of rolling stock and repairs materials, Sir A. Geddes replied that he had no power to give priority.

Essex versus London County Council.—The Essex County Council have now decided to oppose the L.C.C. Tramways and Improvements Bill, which it was stated, if passed in its present form, would enable the London County Council to establish and maintain motor omnibus services between the Metropolis and any place in the County of Essex, without having to obtain the consent of Essex County Council.

Electric Power at Hull.—The Electricity Committee and the Tramways Committee of Hull Town Council have approved the proposal that electric power required for the tramways shall be obtained from the Electricity Committee's generating station at Sculcoates. Hitherto the current has been supplied from the tramways department's own generating station. The change has been made for reasons of economy, and has, no doubt, been brought about by the introduction of the Electric Supply Bill in Parliament.

London Omnibuses from the Army.—In the House of Commons, on May 21, Mr. Gilbert asked the Secretary of State of War whether any steps are being taken by his Department to return motor-omnibuses no longer required for war purposes in France and Belgium, so that they may be returned to the motor omnibus company in London for traffic purposes here? Captain Guest: The War Office offered in February last to withdraw omnibus chassis from France, and were informed that they were not required.

Ayr Tramways Extension Deferred.—The proposal to extend the tramways system of Ayr Corporation to take in the villages of Annbank, Mossblown and Whitletts, at the petition of the inhabitants, was considered by the Tramways Committee. It was shown that, to return expenses, the total population of the three villages would have to be carried 350 times in a year. In view of the facts, the Committee recommended that the proposal be deferred. The Town Council accepted the recommendation of the Committee.

Repairs on Leeds Tramways.—The "Yorkshire Post" states that the Leeds Tramways Committee is giving serious attention to the task of making good the wear and tear of the tramway system during the past four years. Owing to the scarcity of labour and materials, it is impossible to undertake any comprehensive scheme, and the work must be done piecemeal as materials come to hand. Repairs are urgently needed to both rolling stock and tracks, but the Committee has no intention of going abroad for material.

Tramwaymen Referred to the Manager.—In reply to a letter from the Secretary of the Amalgamated Association of Tramway and Vehicle Workers, asking them to receive a deputation to discuss certain matters, the Tramways Committee of Rawtenstall Town Council resolved: That this Committee do not favour, as a principle, direct negotiation with their employees, but regard it as part of the manager's duties to meet and make arrangements with the Union representatives and to report matters to the Committee and obtain their instructions.

New Electricity Scheme for Hull.—The Electricity Committee of Hull Corporation considered at a recent meeting a new scheme for extension of the electricity undertaking. The acting engineer pointed out that increasing demands were being made on the undertaking, and the new bulk supplies in connection with which negotiations were proceeding, including the supply to the tramways, were estimated to result in an increased demand equal to the total output of the undertaking at March 31, 1914. The estimated cost of the scheme was £123,721. The proposals of the acting engineer were approved and the report was referred to the Finance Committee.

Lighter Type of Omnibus Recommended.—In the House of Commons, on May 20, Mr. J. D. Gilbert asked the Home Secretary if the Chief Commissioner of Police is requiring a new type and standard of omnibus for the Metropolitan area before he will license same; and in what manner the new standard varies from existing types, licensed as to weight, build, passenger-carrying capacity and other important features? Sir H. Greenwood, in reply, stated that the Commissioner had urged the desirability of designing a lighter type of omnibus, or alternatively of improving the springing, but did not suggest any variation as to existing dimensions or as to the number of passengers.

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Between Two Systems.—Chadderton is the terminal point where the systems of Middleton Electric Traction Company and Oldham Corporation meet, and either by design or by "the malignity of inanimate things," the departure of the cars on the one system coincides with the near approach of the cars on the other system, with the consequence that passengers have the chagrin of seeing the car they hoped to catch gliding away into the distance just as they come up. Chadderton District Council have complained to the managers of the Oldham and the Middleton tramways, and have received promise of amendment.

Car Steps Too High.—At the recent meeting of Dundee Corporation Tramways Committee, complaints were mentioned that the tramcar steps were too high. Mr. Fisher, general manager of the tramways, explained, however, that, from the construction of the Dundee cars, and the fact that there was only three feet separating the rails, as compared with four feet in most other places, it was not an easy matter to lower the car steps. The Committee recommended that Mr. Fisher should consult with the makers of the cars as to how the difficulty might be got over, and at the same time to arrange for improvement of the new cars on the lines indicated.

Co-operative Ownership for Omnibus Drivers.—An opportunity is about to be offered to London omnibus drivers for acquiring their own vehicles. Under the auspices of the London and Provincial Licensed Vehicle Workers' Union, an association, named the Motorbus Co-operative Society, has been registered, with Mr. H. Bundy as secretary. A contract has already been placed with a firm in the North of England for the construction of a fleet of omnibuses for the society. These vehicles will resemble the ordinary omnibuses of the L.G.O.C., but will be lighter and equipped with pneumatic tires. The omnibuses are designed to carry 26 passengers. Plans have been submitted to Scotland Yard, and it is arranged that the drivers will be enabled to purchase their vehicles on the instalment plan.

Hull Tramways Committee.—Five new members have been elected to Hull Tramways Committee, and seven of the old members have been re-appointed, and it would therefore seem that the former committee was not so very inefficient, after all. At the first meeting of the newly constituted committee, a letter was received from Alderman Robson, one of the re-elected members, in which he said: "After receiving the Grand Order of the Boot at the hands of the City Council, I cannot admit that the application of a soothing plaister in the shape of a seat on the new committee removes the indignity of being thrown off after my 34 years' service." Col. Walker, the new chairman, said they would have to pursue a vigorous policy in order to get a good and efficient service. Their financial position must be improved, and a new manager appointed.

Fares and Queues.—At the recent meeting of Cardiff Corporation Electric Lighting and Tramways Committee, a letter from the National Union of Railwaymen was read, in which it was alleged that Cardiff tramway fares were 200 per cent. above pre-war rates, and protesting against the continuance of increased fares. Sir John Courtis, chairman of the Committee, pointed to the fact that the increase in fares amounted only to 16 per cent. on the highest pre-war rates and 50 per cent. on the lowest. Complaints had been received, alleging that the crushing at the car stations and termini had become serious, degenerating into a scramble. Mr. Arthur Ellis, general manager and engineer, intimated that arrangements were being made for the adoption of the queue system wherever possible, that method having been used on one route already, with the best results.

Edinburgh Corporation and the Tramway Employees.—In view of the fact that Edinburgh tramways will be taken over by Edinburgh Corporation on June 30, Mr. R. S. Pilcher, the manager of the Tramways Department, held a conference on Friday, May 16, with a deputation of the tramway employees. Various points were discussed, and it was agreed that the existing working conditions should remain in force, but that any questions the workers might wish to raise would be fully discussed after the Corporation management had been given a trial. An interesting point was raised on the system of collecting fares, and the deputation indicated that some changes might be advantageously made in the tickets, lessening the work of the conductors and reducing the risk of confusion in the minds of the passengers. Mr. Pilcher intimated that he was working out a new system of tickets, which would be introduced on July 1, and the deputation agreed to give the new system a fair trial before making any further representations.

National Transport Workers' Federation.—The annual general council meeting of the National Transport Workers' Federation will be held at Swansea on June 5 and 6. The Executive Council will propose a resolution that every means should be employed to maintain the advance in wages gained by the affiliated unions during the war, and instructing the executive to take immediate steps, together with the other two organisations of the triple alliance, to declare in favour of the conversion of all increases obtained during the war into actual wage rates. The Licensed Vehicle Workers' Union will propose a resolution congratulating the triple alliance on the stand made in remaining aloof from the Government National Industrial Council, and affirming that no useful purpose could be served by such an assembly unless and until the workers are assured of more democratic control of industry, with the object of ultimately eliminating rent, interest and profit. The Vehicle Workers' Union will propose a resolution supporting the principle that the means of transport by road, rail, air and water should be owned by the nation and controlled jointly by the State and the employees.

Sale of Government Motor-Cycles and Side-cars.—At the Gilbey Hall of the Agricultural Hall, Islington, on Saturday, May 24, the Ministry of Munitions will offer for sale 300 new and second-hand motor-cycles and side-cars, by direction of the Surplus Government Property Disposal Board. The lots offered include 70 new 2¾ h.-p. Douglas singles and 30 4-h.p. Douglas cycles with side-cars. The sales are to be continued on Tuesdays and Saturdays, and a general sale of cars, lorries, tenders, and cycles will be held on May 27. It is stated that the hall has been taken up till August 15, and if success warrants the step, sales may be held four days per week. Most of the machines come from Kempton Park, but others are from France, the repair shops at Woolwich, and some from Slough. It is expected that the motor cycles will fetch an average of £15 apiece.

Motor Taxation and Road Maintenance.—When the Motor Spirit Duties were introduced in 1909, Mr. Lloyd George, then Chancellor of the Exchequer, undertook that the resulting revenue would be earmarked "for the purpose of improving the roads and to make better motor roads." The revenue was diverted in consequence of the war, and it seems highly advisable that the pre-war arrangement should be restored. At present, the Government propose merely to adopt a policy of yearly grants to the Road Board, but, as the Motor Legislation Committee points out, a definite revenue is required, and allocations of uncertain amounts from year to year will not meet the requirements of the case. Local authorities cannot be expected to formulate road programmes extending over a number of years unless they are certain of financial backing from such a fund as the revenue from petrol and motor taxation provides.

L.C.C. Trailer Cars.—Mr. Bridgeman, Parliamentary Secretary to the Board of Trade, replying to Lt.-Col. Archer-Shee (Finsbury, C.U.) in the House of Commons on Friday, said that the Board of Trade had no power to compel the London County Council to run open trailer cars. The Council had been authorised by Parliament to run trailer cars on certain routes, and, as the hon. and gallant member would be aware, do in fact run them. Lt.-Col. Archer-Shee asked whether the hon. member would represent to the London County Council that the number of these cars was nothing like sufficient, and Lt.-Col. Sir F. Hall asked whether it was the fact that it was only after considerable trouble with the police authorities that permission was given for the running of trailer cars and that the police were trying to hold it up. Mr. Bridgeman replied that this was not a matter for the Board of Trade, but that he would make representations if that was desired.

FINANCIAL.

British Columbia Electric Railway.—An interim dividend of 2½ per cent. is announced on the deferred ordinary stock

The Edison Swan Electric Co., Ltd.—The directors have declared an interim dividend of 3 per cent. (less income tax) in respect of the old Ordinary Shares, for the year ending June 30, 1919, payable on June 16.

Siemens Brothers.—In their annual report, the directors of Siemens Brothers and Co. recommend a final dividend of 5s. per share, making a total dividend, for the year ended December 31, of 10 per cent. free of tax.

Electric Construction.—For the half-year ended on March 31, the directors of the Electric Construction Company recommend a final dividend at the rate of 9 per cent. per annum on the ordinary shares, making 7½ per cent. for the year; they also recommend payment of a bonus of 2½ per cent. on the ordinary shares, less tax.

Shanghai Electric Construction Co.—A dividend is announced at 5 per cent., and a bonus of 5 per cent. (making 20s. per share) less income tax on the ordinary shares, making 15 per cent. for the year. The sum of £10,000 is placed to reserve for renewals, £8,000 is written off preliminary expenses, and £10,103 is carried forward.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended May 21 amounted to £84,039, an increase of £11,950 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to May 21 (seven weeks and two days) the total receipts were £573,422, an increase of £144,171 on the corresponding period of 1918

Bath Electric Tramways.—Presiding at the annual meeting on May 22nd, Mr. J. B. Hamilton, chairman, said that the result of the year's working showed that upward curve which was characteristic of tramway undertakings throughout the greater period of the war. The increase in traffic receipts had amounted to £12,464, a gratifying result considering the size of their undertaking. The working expenses had increased by £9,100, and on the whole they were only better by about £3,000. In view of the increased cost of materials and labour, the directors felt it necessary to lay aside an increased amount for renewals. In addition to the contingencies and renewals fund, which amounted to £32,500, they were carrying forward £6,079 to next year's account. In referring to the recent national arrangement with tramway employees, the chairman said that their company's expenditure for wages would probably show an increase of £6,000 over the figures for 1918. Whether they were at the end of this no one could tell. They had recently purchased ten new chassis, and he thought the motor prospects encouraging. In alluding to the work of the staff at Bath during the year, he said that Mr. Hardy, their manager and engineer, had shown himself to be a man of enterprise and considered judgment in advising the directors, and their thanks were due to him for the assistance he had given in carrying on the undertaking during a very difficult period.

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Albion Motor.—The directors' report of the Albion Motor Car Company for the year ended December 31, states that, after deducting necessary depreciations and other expenses, there remains a net profit of £76,511, which, with £17,513 brought forward, makes a total of £94,024. From this the directors have transferred £30,000 to the reserve fund, and after making allowances for debenture discount and expenses, and deducting preference and interim dividends, there remains £44,532. On this the directors recommend a final dividend of 15 per cent. on ordinary shares, making 20 per cent. for the year, and a carry forward of £25,153.

PERSONAL.

Mr. E. M. Lacey has been appointed consulting engineer by Aberdare Council in connection with the extension of the tramway services. The extensions are estimated to cost £100,000.

Sir Auckland Geddes has been appointed President of the Board of Trade, and it is understood that he will postpone taking up his duties as President of McGill University (Montreal) until next year.

Sir Albert Stanley has, it is understood, resigned the presidency of the Board of Trade owing to ill-health. He proposes to make a visit to America, and will retain his seat in the House in the meantime.

Thomas D. Kirkland, who has recently returned from service with the Forces, has been appointed manager of the Stirling and Bridge of Allan Tramways Company, in succession to Mr. Andrew Henderson, who has resigned owing to ill-health.

Mr. R. Ainsworth has been appointed managing director of the Manchester Armature Repair Company, Ford Lane, Pendleton, Manchester. For many years Mr. Ainsworth was chief electrical engineer to Messrs. P. R. Jackson and Company.

Mr. W. P. Young has been recommended by the Tramways Committee of Edinburgh for appointment as traffic superintendent of the Corporation tramways. Mr. Young, who is a native of Aberdeen, is at present principal assistant to the manager of Belfast Corporation tramways.

Sir George Gibb's Dual Position.—In the House of Commons, on May 19, Mr. Joynson-Hicks asked if it was the case that Sir George Gibb had returned to the service of the North-Eastern Railway Company, while continuing to act as Chairman of the Road Board. Mr. Chamberlain, in reply, stated that Sir George Gibb's present connection with the North-Eastern Railway Company is in an advisory capacity only, and does not preclude his full discharge of his duties at the Road Board.

We regret to record the death of **Mr. C. E. Dewey,** freight traffic manager of the Grand Trunk Railway, Montreal, which took place suddenly on Friday, May 16. Mr. Dewey was one of the most popular railway officials in Canada, and a nephew of Sir Thomas Dewey, Chairman of the Prudential Assurance Company.

CONTRACTS AND ORDERS.

Sunderland Town Council has accepted the tender of B. I. and Helsby Cables Limited for l.t. feeder and service cables.

Smith and Coventry, Ltd., are supplying a 36-in. plain horizontal milling machine, complete with motor and starter, to Bolton Tramways Committee.

Leeds Tramways Committee have recommended the acceptance of a tender of the British Westinghouse Company for a rotary converter.

The Brush Electrical Engineering Company's tender for ten double-deck, top-covered car bodies, with vestibules, has been recommended for acceptance by Walsall Town Council.

Callender's Cable and Construction Company's tender for mains to be supplied during the coming year has been recommended for acceptance by Walsall Town Council.

Rotherham Town Council has placed an order for four double deck tramway cars with Dick, Kerr and Company, Limited, at £2,190 each, and 12 new bodies without top covers at £1,705 each.

Bolton Electricity Committee have recommended the acceptance of the following tenders: Supply of cable for twelve months, British Insulated and Helsby Cables, Ltd., I. Frankenburg and Sons, Ltd., and W. T. Henley's Telegraph Works Company, Ltd.

THE

ENGLISH ELECTRIC COMPANY

LIMITED.

Queen's House, Kingsway, London, W.C.2.

This Company, with a Capital of £5,000,000, has been formed to consolidate under one direction and management the various interests of the following companies, in all of which a predominating control exists:—

COVENTRY ORDNANCE WORKS, LTD.
DICK, KERR & CO., LTD.
PHŒNIX DYNAMO MANUFACTURING CO., LTD.
UNITED ELECTRIC CAR CO., LTD.
WILLANS & ROBINSON, LTD.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	Apr. 22	460	769	+ 309	3	1,880	—
Aberdeen Corporation	May 14	2,282	3,166	+ 884	50	181,751	+ 22,699
Ayr Corporation	" 17	479	606	+ 127	52	29,650	+ 6,264
Belfast City	" 16	7,714	10,158	+ 2,444	7	69 141	+ 15,707
Birkenhead Corporation	" 18	2,185	2,480	+ 295	6½	16,532	+ 2 200
Blackburn "	" 14	1,672	2,350	+ 678	7¼	16,702	+ 4,627
Bradford Corporation	" 10	7,461	10,807	+ 3,346	6	64,211	+ 19,258
Burnley Corporation	" 17	2,070	3,131	+ 1,061	..	..	.
Burton-on-Trent Cor.	" 18	418	478	+ 60	7	3,153	+ 507
Bury Corporation	" 18	2,067	2,424	+ 357	7½	16,772	+ 4,120
Chatham & District	" 8	1,301	1,567	+ 266	18	23,650	+ 2,079
Cork Electric	" 8	618	683	+ 65	18	10,195	— 624
Derby Corporation	" 17	1,565	2,141	+ 576	7	11,562	+ 1,678
Dundee City	" 14	1,695	2,260	+ 565	52	103,747	+ 21,792
East Ham Corporation	" 17	1,427	1,981	+ 554	6½	12,693	+ 3,719
Glasgow Corporation	" 17	29,508	33,523	+ 4,015	50¼	1,457,507	+ 114,929
Glossop (U.E. Sup. Co.)	" 17	181	225	+ 44	20	4,390	+ 823
Halifax Corporation	" 13	2,572	3,367	+ 795	6¼	21,414	+ 5,550
do. Motor Buses	" 13	58	76	+ 18	6¼	486	+ 132
Huddersfield Corporation	" 17	3,544	4,365	+ 1,821	7	33,197	+ 8 619
Ilford U.D. Council	" 17	989	1,344	+ 355	7	8,086	+ 1,932
Ipswich Corporation	" 17	756	909	+ 153	7	5 558	- 1,098
Isle of Thanet	" 17	263	856	+ 593	33	13,442	+ 7,328
Kilmarnock Corporation	" 17	129	149	+ 20	¾	149	+ 20
Lanarkshire	" 8	3,463	1,881	— 1,582	18	55,979	— 4,966
Leeds City	" 17	11,566	17,351	+ 5,785	7	111,725	+ 36,581
Leicester Corporation	" 17	4,688	6,005	+ 1,317	..	..	.
Leyton U.D. Council	" 15	2,098	3,270	+ 1,172	7	20,831	+ 7,313
Liverpool Corporation	" 17	18,338	23,293	+ 4,955	19½	410,223	+ 77,859
Llandudno & Colwyn Bay	" 9	333	511	+ 178	2½	8,033	+ 1,722
London County Council	" 22	72,089	84,039	+ 11,950	7½	573,422	+ 144,171
Maidstone Corporation	" 15	251	379	+ 128	6½	2,508	+ 638
Manchester Corporation	" 17	25,248	31,083	+ 5,835	7	206,221	+ 42,872
Newcastle-on-Tyne Cor.	" 17	9,246	9,283	+ 37	7	61,393	+ 2,732
Northampton Cor.	" 2	900	1,170	+ 270	5	5,729	+ 1,428
Nottingham Corporation	" 15	5,776	7,366	+ 1,590	7	45,968	+ 10,141
Oldham Corporation	Mar. 5	2,802	2,800	— 2	41	141,684	+ 25,756
Reading Corporation	May 15	1,244	1,579	+ 335	6½	9,796	2,112
Rhondda Tramways	Mar. 20	1,633	2,150	+ 517	11	23,210	+ 5,603
Rotherham Corporation	May 14	2,043	2,261	+ 218	6½	14,531	+ 1,608
Sheffield Corporation	" 1	13,565	16,446	+ 2,878	6½	113,224	+ 24,546
Southampton Cor.	" 14	2,446	2,731	+ 285	6½	16,894	+ 1,318
Southend-on-Sea Cor.	Apr. 30	730	1,424	+ 694	5	7,259	+ 4,000
South Shields Cor.	" 26	1,059	1,601	+ 541	4	5,858	+ 1,419
Sunderland Corporation	May 18	2,021	2,851	+ 830	7	19,526	+ 5,109
Swindon Corporation	" 14	280	335	+ 55	6½	2,031	+ 180
Torquay Tramways	" 8	752	1,070	+ 318	18	15,049	+ 1,893
Tyneside Trys. & Trmrds.	" 7	906	989	+ 83	19	16,385	+ 263
Wallasey Corporation	" 17	1,721	2,509	+ 788	6½	16,505	+ 5,062
Walsall Corporation	" 17	1,206	1,389	+ 183	7	9,683	+ 1,532
Walthamstow U.D. Coun.	" 17	1,505	1,983	+ 478	7	12,374	+ 3 310
Warrington Corporation	" 15	712	875	+ 163	8	5,814	+ 1,109
West Ham Corporation	" 15	4,235	5,768	+ 1,533	6½	35,012	+ 8,738
Wigan Corporation	Jan. 2	2,357	2,424	+ 77	39	96,562	+ 15,560

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	May 13	£56,634	£64,295	19	£1,104,447	+ £51,111
Auckland (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Mar.	3,803	3,051	48	42,131	+ 1,444
Brazilian Traction (Mlrs.)	Mar.	8,094,000	9,330,000	13	25,824,000	+ 2,578,000
Brisbane	Apr.	35,530	32,775	17	151,110	+ 13,541
British Columbia $	Mar.	510,892	649,120	39	5,390,119	+ 894,848
Buenos Aires Lacroze	Apr.	41,643	43,607	43	434,186	+ 46,122
Burmah Tram. & Light Rs.	Apr. 30	27,614	36,815	39	325,085	+ 86,230
Calcutta Rs.	May 10	74,683	82,452	18½	1,576,462	+ 216,616
Cape Town	Nov.	16,522	18,385	..	..	..
Carthagena and Herrerias	Apr	4,200	1,786	17	10,192	— 7,366
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	Apr.	1,791	1,920	39	17,548	+ 5,261
Hong Kong $	Apr. 5	13,111	12,836	14	198,630	+ 6,962
Kalgoorlie	Jan.	2,522	2,562	4	2,562	+ 40
La Plata	Apr.	5,169	5,630	17	23,650	- 3,677
Lima	Feb.	41,921	46,082	8	91,444	+ 5,962
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	Apr. 30	42,911	44,716	17	271,568	— 49,156
Manaos Rs.	Aug.	150,657	132,507	34	1,152,686	+ 58,959
Manila $	Mar.	172,750	207,792	13	650,745	+ 142,995
Montevideo	Apr.	33,704	27,014	26	227,905	+ 21,865
Para	Mar.	24,848	26,022	17	97,585	+ 3,164
Pernambuco	May 18	4,323	5,688	19½	106,863	+ 15,472
Peruvian $	Feb.	925,410	948,470	34	7,973,835	— 229,195
Port Elizabeth	Nov.	3,807	3,498	...	...	...
Rangoon	Apr.	5,865	6,217	17	25,817	+ 2,954
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore $	Mar. 15	14,101	16,307	11	178,525	+ 31,018
Toronto $	Mar.	1,113,472	1,083,285	13	3,205,922	+ 42,198
Winnipeg $	Mar.	307,289	384,937	13	1,146,638	+ 205,808

WANTED.

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SATURDAY, MAY 31, 1919.

EXIT STANDING COMMITTEE B.

AFTER sitting eighteen days, extended over a period of two months, the Standing Committee on the Ways and Communications Bill came to an end on Wednesday. A review of the proceedings of the Committee should leave any reasonable person connected with tramway undertakings fairly well content. Of course, the mind of the tramway and transport industry, as a whole, leans to the maintenance of the utmost freedom possible to private enterprise, and the arguments of the individualists may be assumed to be logical and the very essence of truth, but the facts of the case must be faced, and they press all the other way. Notwithstanding conspicuous instances of successful company enterprise, it must be allowed that the vast majority of the larger tramway undertakings are in the hands of local authorities popularly elected, and that they have been carried on well. Again, there is the still more important fact that the transport facilities of the country are in a chaotic condition. Company contends with local authority, and local authorities with each other; railways are opposed to tramways, and omnibus enterprise contends with both. Money and effort are wasted in useless strife, while the need for transit grows ever more desperate. Between all these public displays, there goes on a keen struggle for equipment, which raises the cost of materials and plant, still further adding to the difficulties of a problem which must be solved if the nation is to live. Men of goodwill are agreed that the establishment of some central authority which will unify the transport services of the country, and direct the utilisation of every existing facility to the best advantage, is indispensable. To begin with, it may be autocratic, or bureaucratic, or anything else you like; but, in order to justify its existence, the Ministry will have to get things done, and that is the essential need of the present situation. So far as purely tramway interests are concerned, the Bill effects changes which will not alter greatly the practical operation of undertakings. One highly salutary provision has been made, and that is the power given to the Minister to order the interchange of running facilities between adjacent tramway systems. Here is an instance where the intervention of a national authority over local authorities should be a distinct benefit. Local councils are apt to allow their self-importance too large a say in such matters, and to postpone agreement costs them nothing, though it may be very costly to the community. Perhaps it may seem good policy for a local authority to depreciate the value of the service of a neighbouring company undertaking, and ratepayers may not too severely chide those who carry it out. But when running powers are given both parties, a just agreement will soon be forthcoming. Moreover, as the Minister has taken power to acquire or control all such company undertakings, the whole aspect of the opposition has been changed. On the other hand, the prospects of tramway, light railway, and omnibus development opened up by the Bill are highly encouraging. Unification and co-ordination of all the transit facilities of the country are now rendered possible. The individualist dream of a plethora of competing services in the shape of company tramways, light railways, omnibuses, tubes, and underground railways, each dependent upon its efficiency and cheapness for its dividends, has faded away into the impossible. The actual existence of publicly controlled transport facilities, by road and rail, on the highway or under the ground, mutually serviceable and co-ordinated, will afford ample scope for the energy and ability of engineers, managers, and financiers, and the vision is not without a grandeur of its own. Strenuous opposition is certain to be offered to the third reading of the Bill, but in view of its urgent importance, the Government is not likely to admit serious modification of the measure.

MIDDLESBROUGH CORPORATION BILL.

In giving evidence before the Select Committee of the House of Lords which is considering the tramways clause in the Middlesbrough Corporation Bill, Mr. J. B. Hamilton, who has been retained as their expert adviser by the Middlesbrough Corporation, said that ¾d. was the rate of contribution which had been generally fixed toward road maintenance on country roads traversed by motor omnibuses and trackless trolley vehicles. Owing to the rise in the cost of labour and material, it was fair that the contribution should be augmented, and the Corporation of Middlesbrough proposed to double it, making it 1½d. per car mile. Experts were inclined to believe that the wear and tear of the trackless trolley vehicle was less than that of the motor omnibus. Mr. C. J. Spencer, manager of the London United Tramways, who, together with Mr. Hamilton, reported on the Middlesbrough undertaking, gave evidence in support of the Bill. Traffic on the Port Clarence Salt Works route could best be handled by a tramway, but at the moment a tramway was out of the question, owing to the difficulty of getting rails. Home manufacturers were reorganising their works to meet foreign competition, and were unable to fill orders. Because of the abnormal state of the steel market, it would be most difficult to place a contract for tramway construction. The alternative was the railless system. He estimated that the cost of motor omnibus working would be 5d. per mile more than the trackless trolley. The Board of Trade, in their report on the Bill, had pointed out that the minimum fare proposed was an increase on the present minimum. On this point Mr. Spencer said that the value of a penny had depreciated, and that it was quite impossible to meet current expenditure with the old revenue. A fair proportion of the undertakings in this country were fortunate in having a clause which gives them the right to charge a minimum of 2d., and Middlesbrough desired the same privilege as was possessed, for instance, by many large undertakings such as Bradford and Sheffield. Mr. A. R. Fearnley, general manager of Sheffield Corporation tramways, also gave evidence in support of the Corporation's case. Mr. Charteris, K.C., for Durham County Council, claimed an increased contribution toward road maintenance. Stockton had agreed in respect of its proposed motor omnibus service to pay 1¼d. per 'bus mile. Middlesbrough's offer of ¾d. was quite insufficient. He claimed 2d. per mile for railless cars and omnibuses, and there should be a contribution of one-third of the cost of the adaptation of the road, if adaptation were necessary for the promoters' purpose. The case was concluded on May 23rd, but the Committee decided to hear the case for Stockton before coming to a decision.

After deliberation in private, the Committee found with reference to the Stockton Bill that the Bill may proceed, provided that the right to run motor 'buses is limited to a period of seven years.

With reference to the Middlesbrough Bill, the Committee found that the Bill may proceed, provided (1) that no powers are granted as to trolley vehicles or tramways north of the Tees; (2) the right

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to run motor-buses north of the river is limited to the route between Port Clarence and the Salt Works, and from Port Clarence to Greatham Creek; powers limited to seven years.

As regards the contribution to be made by the promoters of the Middlesbrough Bill, the Committee decided (1) the amount to be paid for improvement or adaptation of the road is to be half of one-third of the cost contributed under agreement by Stockton; (2) north of the river a contribution of 1½d. per bus mile to be made for maintenance; (3) south of the river 1d. to be contributed for maintenance.

In all these cases the period of seven years may be extended after six years for a further period of seven years, with the consent of the local authorities.

CONFERENCE OF TRAMWAY WORKERS.

The annual conference of the Amalgamated Association of Tramway and Vehicle Workers was held at the Law Courts, Cardiff, on May 20. The delegates were formally welcomed by the Deputy Lord Mayor, Councillor W. Smith, in the absence of the Lord Mayor. Mr. E. Bawden, of Bradford, President of the Conference, in his opening address, referred to the success of the Association in securing a 48-hour week for their members. As to the future policy of the Association, their first aim was to get the war bonus merged into the ordinary rate of wages. Mr. T. Maclean, of Rochdale, was chosen president for the coming year.

During the two-days' sessions of the conference a number of interesting questions were discussed. With reference to the formation of the Joint Industrial Council, the conference approved of the proposal of the executive that the employees' side of the National Industrial Council should contain ten representatives of the Association Executive and five representatives of branches. In the discussion on wages, it was stated that the executive was not attempting to standardise the wages of members, but that the policy was to establish a minimum. Mr. Hirst said that the aim was to level up wages, but he warned members that they could not by a strike or any other means obtain all they wanted at one jump.

L.C.C. TRAMWAY MATTERS.

At the meeting of the London County Council on Tuesday, much time was devoted to the present condition of transport facilities and fares. Mr. W. J. Squires, Chairman of the Highways Committee, announced that the recent increase in fares was now under review, and he invited members to send in any detailed observations.

Among other tramway matters dealt with were the following:—

CRESSY ROAD TRAMWAY DEPOT.—In view of the urgent necessity of securing more accommodation for cars to increase the service, and thus relieve the congestion of traffic, the Council decided to ask the Secretary of State for War to take steps to restore to the Council at the earliest possible date the Cressy Road tramway depot. Since the armistice the military authorities have several times been approached with a view to the premises being vacated at an early date, but the Council had been informed that the premises cannot be surrendered at present and that no definite date could be given.

THROUGH RUNNING WITH WEST HAM CORPORATION.—Under an agreement entered into with the West Ham Corporation in November, 1912, the Council pays to the Corporation the sum of 6d. for each car mile run between Barking Road Bridge and Canning Town Fire Station. The Corporation has now pointed out that during the year 1917-18 the working costs have increased by 2.019d. a car mile, and they have therefore proposed to increase the charge to 8.019d. per car mile for that period, leaving the question of payment for the following year to be considered later. The Council agreed to the proposal. Interim payments for through running arrangements are to be made on the agreed basis for the previous year, to be adjusted at the end of the year after final charges have been ascertained.

CONDUIT TRAMWAY ALONG AMHURST PARK.—In February last the Council decided to make application to Parliament in the present session for authority to construct new tramways, including, among other proposals, a line from Seven Sisters Road to Stamford Hill, via Amhurst Park. The estimated cost of the construction and equipment on the overhead system was £52,100. The Hackney and Stoke Newington Metropolitan Borough Councils have not yet given their consent to the proposed tramways, and one of the principal objections to the scheme has been the proposed change point at the east end of Amhurst Park and the employment of the overhead system. As the tramways would be operated in connection with other conduit routes, and having regard to the attitude of the local authorities, the Highways Committee recommended that the Bill should be amended so as to provide for the use of the conduit system. The construction of the tramways on the conduit system is estimated at £80,000.

All tramway reports were adopted.

A motion instructing the Highway Committee to bring up a supplemental estimate for the purpose of starting a river steamboat service, proposed by Mr. H. Gosling, was rejected, Mr. Squires stating that the officers had been instructed to submit a report on the question to the Highways Committee.

MISCELLANEOUS NEWS AND NOTES.

Track Repairs at Gateshead.—The Gateshead District Tramways Company are expending about £20,000 in repair work, which is being carried out under the supervision of Mr. W. Morrison, general manager.

Children's Tramway Fares.—The Darlington Tramways Committee propose that the age at which children should be allowed to ride on the cars at half fares should be raised from eight to fourteen years.

One of the Manager's Difficulties.—Dr. L. A. Herdt, a member of the Montreal Tramway Commission, in addressing the Montreal Publicity Association, alleged that one of the causes of the slow tramway service in Montreal is the hobble skirt.

Tramcars Stopped for Beer.—As a protest against the shortage of beer, a crowd of several hundred persons held up the tramway service in Openshaw, Manchester. About thirty tramcars were stopped, and demands for more beer were written on them in chalk.

Through Running at Sunderland.—Sunderland Rural District Council resolved, at a recent meeting, to present a memorial to the Board of Trade, asking for through-running powers over Sunderland Corporation's system, and to protest against the action of Sunderland Town Council in refusing to agree to such a course.

Employees' Demands for Peace Celebration Days.—The National Amalgamated Association of Tramway and Vehicle Workers has applied for double pay for tramway employees who work on peace celebration days, the number of peace celebration days to be added to the annual holiday of employees who work on these days; and the first day of the celebration to be a holiday for all tramway men.

Tramway Employees' Gallantry.—The Birmingham Tramways Committee have complimented Inspector P. G. Ford and Motormen C. J. Pickering and J. Reeves for courageous conduct, and have presented them with £1 each. Ford and Reeves stopped runaway horses and Pickering rescued a child from the track before an approaching car.

Women on London Tramcars.—The Chairman of the Highways Committee, Mr. W. J. Squires, stated that no additional women conductors have been engaged by the London County Council tramways since the armistice. Practically all women who have since left the service have resigned voluntarily. There are still 1,250 women employed, and all these would be released when the men returned to fill their positions.

Bonus to London Tramway Officials.—The General Purposes Committee of the London County Council has recommended that for the year 1919 the electrical engineer and traffic manager of the Council's tramways department be granted 10 per cent. addition to their salaries, plus a war bonus of £80 a year, with a maximum increased payment of £300 a year, to be paid in the same manner as in the case of all officers in receipt of £800 a year and over.

Alterations in Fares at Liverpool.—In response to complaints regarding the new fare charges, Liverpool Corporation Tramways Committee put before the City Council a recommendation that the fares on five routes be reduced. Appeals were made for the establishment of more short penny stages, but Mr. Halsall declared that they were impracticable, owing to the difficulty in collecting the fares. The Tramway Committee's recommendations were agreed to.

Oil in Derbyshire.—In the House of Commons, on Thursday, Mr. Kellaway announced that the Government "had struck oil" at Hardstoft. Work on the boring commenced in October last, and on Tuesday night a depth of 3,075 ft. had been reached and traces of oil were found. On Wednesday morning the oil rose to a height of 400 ft. To enable arrangements to be made for keeping the oil under control, the work will be suspended several days, but within a week the extent of the flow will be known.

The Tramways and Light Railways Association.—The *Journal* for May, 1919, contains particulars of the formation of a Joint Committee of representatives of employers and employees, which has been set up pending the final establishment of the Joint Industrial Council for the Tramway Industry. Other notices relate to the report of a Committee for the extension of tramway sidings into goods yards, and the constitution of a Standing Conference formed by the company employers who are members of the Association.

London Traffic Enquiry Committee.—The Committee of Inquiry into London Traffic appointed by the Government will consist of the following members: Sir Frederick Hall, Colonel Assheton Pownall, Mr. Lane Mitchell, Mr. Kennedy Jones, Colonel Sir M. Archer-Shee, Mr. G. Balfour, Mr. Clement Edwards, Mr. J. D. Gilbert, Mr. C. F. Higham, Mr. Foreman, Mr. C. W. Bowerman, Mr. John Jones, Mr. Newbould, Sir R. Park Goff, and Major Joseph Hall. It is understood Mr. Kennedy Jones will be chairman.

Mansfield Light Railway Extension.—The Light Railway Commissioners have decided that the application in respect of Mansfield and District Light Railways should be granted, subject to the following limitations: That provision shall be made for an average increase of 50 per cent. in maximum fares and rates on the authorised lines and extensions proposed; that no traffic other than passengers and parcels shall be carried on the proposed new lines; that, in regard to the proposed light railway through Forest Town to Clipstone Colliery, construction should not be authorised beyond Clipstone Park Drive Lodge, or such less distance as would obviate undue competition with existing facilities, without unduly disregarding the public interest.

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Unions Combine.—An agreement has been made between the Associated Society of Locomotive Engineers and Firemen and the London and Provincial Union of Licensed Vehicle Workers, the object of which is to enable the two unions better to protect the interests of their members employed on London tramways, omnibuses and electric railways. In the event of any dispute with employers in any section the unions have agreed to call out all their members. Before a strike is decided on by either union it must notify the other with a view to joint negotiations for the purpose of avoiding a dispute if possible.

War Lorries for Passenger Work.—The Government have decided to use War Department lorries to relieve the pressure on the tramways and omnibuses in the Metropolitan area. The first lorries will be run on Monday in connection with the services of the London General Omnibus Company. No seats were placed in the lorries used during the tube strike, but on Monday the vehicles will be fitted with chairs in order to make the passengers as comfortable as possible. The lorries will be driven by licensed drivers of the London General Omnibus Company, and they will first be used as feeders in outlying districts.

London Tramway Strike.—A strike took place on the London United tramways on May 22, when the company issued the following statement :"A partial strike affecting certain portions of the London United Tramway system occurred at Chiswick and Hounslow depots. The trouble was caused by certain motormen refusing to drive with non-union conductors. As a result the motormen were suspended. Mr. Ben Smith, of the London and Provincial Union of Licensed Vehicle Workers, was called in, and after a conference with the company's officials instructed the men to return to work." The full service was resumed on all routes about 2 p.m.

Lanarkshire Tramway Strikers Prosecuted.—Five of the Lanarkshire tramway strikers were prosecuted in the Sheriff's Court at Hamilton on May 22. They were all motormen and were charged with being concerned in disorderly proceedings on May 7. It was alleged that they formed part of a disorderly crowd who smashed the glass of one side of two tramway cars with stones. The charges against three of the men were found not proven, but the other two were found guilty of interfering with the police, and were each fined £5, or fifteen days. The Sheriff characterised the conduct of some of the strikers as far from creditable, and said he was horrified to hear of the action of some of the women in the matter.

Hull Tramways Management.—As will be seen from our advertisement columns, the Hull Tramways Committee are inviting applications for the post of manager. At a recent meeting of the Committee, in a discussion as to the proposed qualifications for a general manager, Mr. Gibson said that the managers of a large number of municipal tramway undertakings were not electrical engineers, and he did not think it would be wise to shut out such men from becoming candidates for the post. The chairman supported the resolution that the general manager should be appointed at a salary of £800, and should be a qualified electrician. Alderman Gillett emphasised the importance of having a manager who had as complete control as a general manager had of a railway company.

West Ham Tramway Reconstruction.—West Ham Tramways Committee are considering the reconstruction of the track in High Street, Stratford, and a portion of the Docks route. The cost of the work is estimated at £35,583. The Committee also propose to obtain 20 car bodies and 10 sets of motors at a cost of £20,500. Mr. M. L. Slattery, the tramways manager, has reported that the track requires complete reconstruction, and that many cars have had to be withdrawn from service owing to their unsatisfactory condition. The Borough treasurer has reported that the reconstruction of the permanent way would cost £370,096, and that the estimated cost of all the tramway manager's requirements would aggregate £451,252, or nearly as much as the total outlay on the existing undertaking. He draws attention to the recent large deficiencies on the tramways, and points out that 250 motor omnibuses, carrying as many passengers as the West Ham cars do, could be bought for £196,000 less than the totals of the proposals now before the Committee.

Edinburgh Tramways.—The Edinburgh Tramways Committee have decided that women conductors should be dispensed with as soon as possible, in view of the large number of returned soldiers, The Committee have adopted the report of the Sub-Committee with reference to fares. On the transfer of the system to the Corporation, the minimum fare for adult passengers will be 1½d., instead of 1d. This means that the increase recently made by the Tramways Company will be continued until it is seen what the financial effect of the transfer will be. The Tramways Committee have received a resolution from the Royal Scottish Academy, condemning on the grounds of amenity the proposal to instal the overhead system in Princes Street. They ask the Committee to exhaust the resources of engineering, to sacrifice the necessary expense, and if need be some degree of convenience, to preserve inviolate the most beautiful street in the world. A deputation has been received from the members of the Rotary Club in favour of the overhead system for the whole city, including Princes Street. The deputation represented that the business community wanted a thoroughly efficient and up-to-date tramway system.

Motor Cycles v. Tramway Cars.—It is said that colliers in the Bolton district, evidently in affluent circumstances, as a protest against the increase in tramway fares, are purchasing motor cycles, which they use going to and from their work.

FINANCIAL.

British Columbia Electric Railways.—An interim dividend of 2½ per cent. is announced on the preferred ordinary stock.

Chloride Electrical Storage Co., Ltd.—A final dividend is announced at the rate of 5 per cent., free of tax, making 10 per cent. for the year.

Electric Construction Co., Ltd.—A final dividend is announced for the year ended March 31 at the rate of 9 per cent. on the ordinary shares, making 7½ per cent. for the year; also a bonus of 2½ per cent. for the half year, less tax.

La Plata Electric Tramways.—After providing for debenture and other interest, the accounts for the year ended Dec. 31, 1918, show a loss of £2,731, which, deducted from the credit balance of £10,359 brought forward, leaves a credit balance of £7,628 to be carried forward.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended May 28 amounted to £82,946, an increase of £19,532 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to May 28 (eight weeks and two days) the total receipts were £656,382, an increase of £163,717 on the corresponding period of 1918.

Straker-Squire, Ltd.—The report for the fifteen months ended March 31, 1919, shows that after providing for all expenses, including depreciation and the balance of preliminary expenses, the profits for the fifteen months (January 1, 1918, to March 31, 1919) were £24,935. Including the sum brought forward of £12,630 there is a total disposable balance of £37,565. Dividends amounting to £17,500 have been paid out of this sum, leaving an available balance of £20,065. The directors recommend the payment of a final dividend of 10 per cent. per annum, less income tax, for the period of fifteen months ending March 31, 1919, amounting to £13,125, leaving a balance of £6,940 to be carried forward. The report states that the company has taken possession of its new factory at Edmonton, and has disposed of the Twickenham works, and the whole undertaking will shortly be carried on at Edmonton, as the premises at Nelson Square are to be sold. The directors report that extensive orders are in hand. Mr. J. J. Jarvis, director of the Fuller United Electric Works, Ltd., has been appointed a director in succession to Mr. Reginald Hely, who has resigned.

Edinburgh Tramway Debt.—On May 27th Edinburgh Town Council discussed the recommendations made by the Treasurer's Committee that in framing the tramway estimates provision should be made to meet out of the revenue of the undertaking (1) payment of a sum of £4,000 per annum in respect of general expenses and maintenance, and (2) payment of interest and sinking fund charges so as to pay off in five years the whole of the unredeemed capital debt incurred in connection with the cable system. Mr. John Harrison said a new tramway debt would be created by the substitution of overhead electric traction for the present cable system. The new debt would probably amount to £1,500,000, and there still remained a portion of the old debt on the cable tramways, amounting to £450,000. The purchase of the cable cars would add another £50,000 and they would have to buy a number of motor omnibuses to supplement the cable system. It was proposed that the old debt should be paid off by £100,000 in each of the next five years. It was stated that the cable assets, consisting of permanent way, station buildings, land, and engines and boilers were valued at £200,000. The engines and boilers, however, would have to be sold for what they would bring as scrap metal, and the assets to be carried forward from the old to the new system were not worth serious consideration.

PERSONAL.

The position of **Borough Electrical Engineer of East Ham** will be filled from a short list, including Messrs. F. W. Purse (Carlisle), G. R. Spurr (Walthamstow) and C. M. Shaw (Worcester).

Mr. P. V. Hunter, chief electrical engineer of Messrs. Merz and McLellan, has resigned that position to join the management staff of Callender's Cable and Construction Company, Ltd.

Alderman Sir Charles W. Starmer has resigned the position of chairman of the Darlington Tramways and Electricity Committee as a result, it is stated, of unfair criticism by certain members of the Council.

Mr. Harry S. Ellis, borough electrical engineer of South Shields, has been appointed to succeed Mr. H. F. Street as borough electrical engineer of Southampton, at a salary of £800 per annum. Mr. Ellis is the son of the late Sir J. B. Ellis, of Newcastle.

Leeds Manager's Salary.—Leeds Corporation Tramways Committee has recommended the City Council to increase the salary of the General Manager, Mr. J. B. Hamilton, from £1,000 to £1,500. In addition to his salary as tramway manager, Mr. Hamilton receives £500 a year in his capacity as City commercial manager.

Private Fred A. Dowers, R.F.A., a former employee of the Cardiff Corporation tramways, was presented at the conference of the Amalgamated Association of Tramway and Vehicle Workers with a gold watch, in recognition of his having been awarded the Military Medal. His wife was presented with a silver tea service. Private Dowers was awarded the M.M. for cutting wires under heavy shell fire. The Lord Mayor of Cardiff welcomed him home, and said they were very proud of him and of the decoration he had won. Private Dowers was the seventh Cardiff tramway employee who had gained distinction, two others having been awarded the D.C.M., and four others the M.M.

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Mr. E. L. Pope, distribution engineer (Southern section) of the London County Council tramways, is retiring owing to ill-health. He entered the Council's service on February 1, 1902, and the Highways Committee have reported that he has rendered valuable service during the whole of the time he has spent with the Council; They recommend that a retiring allowance be granted to him.

Mr. Arthur H. Pott, having resigned his position as general manager and engineer to the Metropolitan Electric Tramways, Ltd., and the London United Tramways, Ltd., is starting in practice as a consulting engineer, but is still retained by the companies mentioned above in an advisory capacity. His temporary address is care of Messrs. F. W. Hayne and Company, 80, Bishopsgate, E.C.2. (Telephone No., London Wall 9574).

Hull Tramways Committee.—The new chairman of the Hull Tramways Committee, Colonel Walker, has been elected chairman of the Staff Sub-Committee, the vice-chairman, Mr. Willoughby, chairman of the Traffic Sub-Committee, Mr. Wokes, chairman of the Finance and General Committee, Mr. Richardson, chairman of the Stores Committee, and Mr. Gibson, chairman of the Claims Sub-Committee.

Colonel S. E. Smith, O.B.E., who has been appointed manager of the Bristol Tramways and Carriage Company, in succession to Mr. Charles Challenger, (recently retired and appointed, a director) at the beginning of the war rejoined his old battalion, the 6th Territorial Battalion, Gloucester Regiment, as major and second in command of the 2/6th battalion. He was attached to the Royal Flying Corps from May, 1915, and was promoted Lieutenant-Colonel, R.F.C., in May, 1916, and acting Colonel on the formation of the Royal Air Force on April 1, 1918.

CONTRACTS AND ORDERS.

Louth Council propose to purchase two steam wagons.

The General Vehicle Company, Ltd., have received an order for an electric dust van at £1,295 from Richmond Town Council.

Electric Lorries for Bristol.—The City engineer of Bristol recommends that six electric lorries be purchased for the work of the Sanitary Committee.

BUSINESS NOTICES.

The Shrewsbury S.T. and Challiner Tyre Co., Ltd., for the convenience of their clients in Liverpool and district, have opened an office in Drury Buildings, 21, Water Street, Liverpool. Telegraphic address: "Chaltyre, Liverpool."

Associated Equipment Co., Ltd.—At the forthcoming Royal Agricultural Society's show at Cardiff, June 24 to 26, the Associated Equipment Company will exhibit an A.E.C. chassis and chars-a-banc at stand No. 125.

POSITIONS VACANT.

ASSISTANT ELECTRICAL ENGINEER.

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TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	Apr. 22	460	769	+ 309	3	1,880	—
Aberdeen Corporation	May 23	2 583	3 088	+ 505	51	134 838	+ 23,198
Ayr Corporation	" 24	246	514	+ 268	1	514	+ 268
Belfast City	" 23	7,901	10,612	+ 2,711	8	79 753	+ 18,418
Birkenhead Corporation	" 25	2,475	2,949	+ 474	7½	19,482	+ 2 774
Blackburn "	" 21	2,954	2,425	— 529	7½	19,128	+ 4,197
Bradford Corporation	" 17	7.916	11.457	+ 3,541	7	75,668	+ 22,799
Burnley Corporation	" 24	2,786	3.148	+ 362	..	..	..
Burton-on-Trent Cor.	" 25	470	487	+ 17	8	3,641	+ 525
Bury Corporation	" 25	2.831	2,405	— 426	7½	19,178	+ 3,647
Chatham & District	" 15	1,301	1,687	+ 386	19	25,837	+ 2,464
Cork Electric	" 15	593	663	+ 70	19	10,859	— 554
Derby Corporation	" 24	1,889	2,158	+ 269	8	13,721	+ 1,974
Dundee City	" 14	1,695	2.260	+ 565	52	103,747	+ 21,792
East Ham Corporation	" 24	1,809	2 016	+ 207	7½	14,709	+ 4,006
Glasgow Corporation	" 24	30,355	34.396	+ 4,041	51½	1,491,903	+ 118 463
Glossop (U.E. Sup. Co.)	" 24	240	225	— 15	21	4,622	+ 808
Halifax Corporation	" 20	4.256	3,514	— 742	7½	24.927	+ 4,809
do. Motor Buses	" 20	92	77	— 15	7½	563	+ 113
Huddersfield Corporation	" 24	5 490	4,828	— 662	8	38,026	+ 7,957
Ilford U.D. Council	" 24	1,297	1,324	+ 27	8	9.409	+ 1 933
Ipswich Corporation	" 24	1,061	857	— 204	8	6 416	+ 854
Isle of Thanet	" 24	413	913	+ 500	35½	14,355	+ 7,828
Kilmarnock Corporation	" 24	244	309	+ 65	1½	458	+ 84
Lanarkshire	" 15	3,659	3,692	+ 33	19	59,671	— 4,093
Leeds City	" 24	15,168	16,927	+ 1,759	8	128,656	+ 37,148
Leicester Corporation	" 24	5,716	6,084	+ 368	..	..	..
Leyton U.D. Council	" 22	2,626	3,259	+ 633	8	24 090	+ 7,946
Liverpool Corporation	" 24	21,233	23.361	+ 2.128	20½	433,588	+ 79,991
Llandudno & Colwyn Bay	" 16	367	523	+ 156	24	8,556	+ 1,878
London County Council	" 28	63.414	82,947	+ 19,532	84	656,382	+ 163,717
Maidstone Corporation	" 22	340	365	+ 25	7½	2,673	+ 664
Manchester Corporation	" 24	30,144	31,737	+ 1.593	8	236.068	+ 45,164
Newcastle-on-Tyne Cor.	" 17	9.246	9,283	+ 37	7	61,393	+ 2,732
Northampton Cor.	" 2	900	1,170	+ 270	5	5,729	+ 1,428
Nottingham Corporation	" 22	7,471	7,274	+ 197	8	53,243	+ 9,944
Oldham Corporation	" 25	4,363	4,625	+ 262	9	37,460	+ 6,988
Reading Corporation	" 22	1,552	1,602	+ 50	7½	11,398	—
Rotherham Corporation	" 21	2,411	2,319	— 92	7½	16,850	+ 1,516
Sheffield Corporation	" 18	13,806	16,826	+ 3,020	7½	130,050	+ 27,566
Southampton Cor	" 21	2,978	2,754	— 224	7½	19,649	+ 1,094
Southend-on-Sea Cor.	" 21	1,604	1,828	+ 220	8	12,453	+ 1,865
South Shields Cor.	Apr. 26	1,059	1,601	+ 541	4	5,338	+ 1,119
Sunderland Corporation	May 25	2,493	2,888	+ 395	8	22,415	+ 5,505
Swindon Corporation	" 14	280	335	+ 55	6½	2,031	+ 120
Torquay Tramways	" 15	750	1,044	+ 294	19	16,094	+ 2,187
Tyneside Trys. & Trmrds.	" 14	1,006	1,100	+ 94	20	17,486	+ 357
Wallasey Corporation	" 24	2,380	2,583	+ 203	7½	19,088	+ 5,285
Walsall Corporation	" 24	1,680	1,416	— 264	8	11,699	+ 1,[illegible]87
Walthamstow U.D. Coun.	" 24	2,056	1,959	— 97	8	14,332	+ 3 212
Warrington Corporation	" 22	850	885	+ 35	7	6 699	+ 1,144
West Ham Corporation	" 22	5,122	5,676	+ 554	7½	40,689	+ 9,292

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Birmingham, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District, Tramways (M.E.T.) Omnibus Co., Wolverhampton Corporation, Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	May 20	£54.104	£60,808	20	£1,165,255	+ £57,815
Auckland (28 days)	Oct 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Mar.	3,803	3,051	48	42,131	+ 1,444
Brazilian Traction (Mrs.)	Mar.	8.094,000	9,330,000	13	25,824,000	+ 2,578,000
Brisbane	Apr.	35,580	38,775	17	151,110	+ 13,541
British Columbia $	Mar.	510,892	649,120	39	5,390,119	+ 894,848
Buenos Aires Lacroze	Apr.	41,643	43,607	43	434,186	+ 46,122
Burmah Tram. & Light Rs.	Apr. 30	27,614	36,815	39	325,985	+ 86,980
Calcutta Rs.	May 17	78.158	85,927	19½	1,662,389	+ 229,385
Cape Town	Nov.	16.522	18,385	..	..	..
Carthagena and Herrerias	Apr	4,200	1,[illegible]86	17	10,192	— 7,8[illegible]
Cordoba	Feb.	12,972	13,549	48	159,208	+ 11,492
East India	Apr.	1,791	1,920	39	17,518	+ 5,281
Hong Kong $	Apr. 5	13,111	12,836	14	198,630	+ 6,962
Kalgoorlie	Jan.	2.522	2,562	4	2,562	+ 40
La Plata	Apr.	5,169	5,630	17	28,650	+ 8,677
Lima	Feb.	41,921	46,082	8	91.444	+ 5,962
Lisbon Escu	Mar.	238 299	276,625	..	..	..
Madras (2 weeks) Rs.	May 15	12,013	46,625	19	318,198	— 44,534
Manaos Rs.	Aug.	150,657	132,507	34	1,152,684	+ 83,959
Manila $	Mar.	172,750	207,792	13	650,745	+ 142,995
Montevideo	Apr.	33.704	37,014	26	227,906	+ 21,868
Para	Apr.	24,745	25,342	21	122,927	+ 8,761
Pernambuco	May 18	4,323	5,688	19½	106,863	+ 15,472
Peruvian $	Feb.	925.410	943,470	34	7,973,835	— 229,195
Port Elizabeth	Nov.	3,807	3,198	...	...	...
Rangoon	Apr.	5.885	6.217	17	25,817	+ 2,054
Shanghai (2 weeks) $	Dec. 11	49.199	52,271	49	1,258,546	+ 47,298
Singapore $	Mar. 15	14,161	16,307	11	176,525	+ 31,018
Toronto $	Mar.	1,113,472	1,083,285	13	3,205,922	+ 42,196
Winnipeg $	Mar.	307,289	384,937	13	1,146,638	+ 205,806

WANTED.

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THE
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SATURDAY, JUNE 7, 1919.

LONDON'S NEED.

The news that the Standing Orders' Committee of the House of Commons had thrown out the "Tramways and Improvements" Bill of the London County Council has been received with feelings of surprise not unmixed with annoyance. Adherence to formal requirements has in this case been carried too far. The Standing Orders Committee has on the whole done good service, but, like many other institutions, it has frequently made the mistake of assuming that its regulations are of more importance than the purpose they and it were designed to serve. Before a Bill can be considered, it must be deposited previous to a certain date, and a tramway Bill must comply with an order requiring that leave shall be obtained from authorities or persons affected. These regulations were framed so that everyone whose interests were concerned in the proposed measure might state their objections and conditions and have ample time to substantiate their contentions should the Bill come before Parliament. But in the case of the L.C.C. Bill everyone interested had received more than ample warning, for the proposals were well known. Further, the Council could not comply with the time regulation, because of war conditions. Moreover, the Bill is absolutely necessary to the proper organisation of the London tramway service, and must be got through at some time or another. What purpose, then, can be served by opposition? Delay will only accentuate the necessity for the measure. It seems a gross misuse of power and a pedantic assertion of an obsolete regulation to hold up a measure designed to obviate difficulties in handling traffic which have become a danger to the State and an object of Parliamentary solicitude. London County Council intend to appeal to Parliament for suspension of the Standing Orders, and in the circumstances it may be hoped they will succeed. If the Bill should be delayed for another year it would inflict great hardship on the public; for the improvements proposed in it will undoubtedly be of great service in the present congested condition of traffic. There are few precedents for the recommittal of the Bill to the Standing Orders Committee, but the case for early consideration of the Bill is so strong that no technical consideration should be allowed to block its course. These are not ordinary times, and the public have the right to require their representatives to deal with such questions on their merits, regardless of Parliamentary precedents.

LONDON TRAFFIC INQUIRY.

The Select Committee of the House of Commons which was recently appointed to inquire into the congestion of London passenger traffic, met for the first time on Thursday morning, Mr. Kennedy Jones, M.P., presiding. The Superintendent of the Public Vehicles Department, Scotland Yard, Mr. Arthur Bassom, gave the number of motor omnibuses licensed on December 31 last as 2,277. In 1914 the number was 3,057. During last year 162 new omnibuses were licensed, and from January 1 to May 31 last 1,325 omnibuses, including several which had been renovated, were licensed. There was greater congestion in the wider than in the narrower streets, as the latter contributed to the more even flow of traffic. Omnibuses were restricted to a speed of 12 miles an hour, and while it might lessen congestion if they were permitted to travel at a rate of 15 miles, he believed that that would greatly increase the danger of the streets. The conditions arising out of the war had caused an increase in street accidents, although the number in the past year showed a decrease over the previous year. There were many difficulties in the way of using the queue system. He believed that an order empowering the police to regulate the routes on the shorter stretches would lessen the congestion considerably. Plans for a new type of taxi-cab have recently been approved by Scotland Yard, and when the manufacturers start to turn them out they will do so at the rate of 200 cabs a week.

Sir William Marwood, of the Board of Trade, gave evidence as to the powers of his department in relation to railways and tramways, and said that he believed the District Railway were running all the trains they could during the rush hours. There were 40 trains an hour, and he did not think it was possible to go beyond that. The rolling stock position was difficult. Some of the stock now in use ought to be in the repair shop. He did not think the Board of Trade would be hostile to the suggestion that there should be some overruling, unifying authority for the whole of the traffic of London. He thought it might be to the good if there was a traffic authority having complete control over omnibuses, tubes and tramways. There was an enormously greater number of people travelling than ever before. The traffic had outgrown the facilities in an extraordinary way. The Board of Trade had no powers to deal with overcrowding.

The Committee adjourned till Thursday next.

MELBOURNE RAILWAYS ELECTRIFICATION.

We are informed that on May 28 an electric service on the Sandringham-Essendon section of the Melbourne Suburban Railways was publicly inaugurated by the Hon. W. A. Watt, Acting Prime Minister of the Commonwealth, the Prime Minister of Victoria, and the Minister of Railways From a cablegram received from Melbourne it appears that everything worked with perfect smoothness, and that the popularity of the electric service is assured This first section is 20 miles in length, but the whole system of railways being electrified includes some 150 route lines.

It will be remembered that German manufacturers made a great effort to have the single-phase system adopted, but when it came to a comparison based upon actual tenders, the 1,500-volt direct current system which was ultimately chosen proved much the cheaper both in first cost and in operation. The work began in 1913, and has been carried out for the Victoria Railways Commissioners under the supervision of Messrs. Merz and McLellan, consulting engineers, Westminster.

The principal contractors were :—Messrs. Babcock and Wilcox, Ltd.; Messrs. C. A. Parsons and Company, the Weymouth Proprietary Ltd. (Melbourne), the General Electric Company (New York), the British Insulated and Helsby Cables, Ltd., and Siemens Brothers Dynamo Works, Ltd.

Municipal Electrical Association.—An alteration has been made in the date of the annual convention of the Incorporated Municipal Electrical Association, and it will be held at Felixstowe on the 18th, 19th, and 20th of June. An interesting programme has been arranged, including discussions, visits to works in the vicinity, and various social engagements. On Wednesday (June 18) Mr. Frank Ayton, engineer and manager of the Corporation electricity supply and tramways department, Ipswich, will deliver his presidential address, and Alderman W. Walker, of Manchester, will read a paper on "The Whitley Report," dealing with the application of its recommendations to the electric supply industry. In the afternoon visits will be paid to various works. On Thursday (June 19) Mr. S. L. Pearce, chief electrical engineer of Manchester, will open a discussion on "Electric Transmission Considerations," and Bailie W. B. Smith, of Glasgow, will read a paper on "The Rating of Electric Supply Undertakings." The annual dinner will take place in the evening. The conference will close with the annual business meeting on Friday morning. The headquarters will be at the Felix Hotel, Felixstowe.

Trolley System for the Hastings Front.—Hastings Tramways Company have asked the permission of the Town Council to instal the overhead system on the sea front line. It is stated that the petrol electric system has not been found satisfactory, and that the previous surface contact system was unworkable, and was condemned by the Board of Trade.

Rolling Stock Wanted at Walthamstow.—The general manager of Walthamstow Council tramways has been asked to report on the possibility of purchasing or hiring second-hand tramway cars.

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L.C.C. TRAMWAY MATTERS.

At the meeting of the London County Council on Tuesday, a number of reports were brought up by the Highways Committee, including among others the following :—

TRAMWAYS IN HIGH STREET AND EAST HILL, WANDSWORTH.—In July, 1914, the Council decided to construct the authorised tramways in High Street, Wandsworth, and East Hill, and of the junction line leading from High Street into Garratt Lane, and the capital estimate for the work of £26,000 was approved. Owing to the difficulties in connection with certain street improvements along the route, it was not possible to proceed with the whole of the tramways, but tenders were invited and the offer of John Mowlem and Company, Ltd., was accepted for a part of the tramways in East Hill between the existing terminus and Fairfield Street. Construction was postponed on account of capital restrictions due to the war, and these restrictions having been removed, the Highways Committee recommended that the work should now be done. Revised estimates prepared on the basis of present prices are as follows :—Track work, including rails, special work, paving and alterations to mains, £46,400 ; sub-station equipment, £120 ; cables, £500 ; ducts, £150 ; feeder pillars, £100, making a total of £47,290.

TRAMWAYS FROM LEE GREEN TO ELTHAM.—The same circumstances have prevented the construction of tramways from Lee Green to Eltham, the capital estimate for which in 1914 was £57,025. Tenders had been accepted for these lines, but construction was deferred. The estimates now framed give a total of £134,710, made up as follows :—Track work, including rails, special work, paving and alterations to mains, £98,000 ; sub-station equipment, £360 ; overhead equipment, £10,000 ; car equipment, £2,340 ; cables, £17,730 ; ducts, £5,880 ; feeder pillars, £400. A supplemental estimate in both cases was approved by the Finance Committee.

MOTOR LORRIES FOR BREAKDOWN PURPOSES.—The need of a heavier type of motor lorry for breakdown purposes has become an urgent necessity. The vehicles at present in use have been in constant service since their purchase in 1910, and they have now become generally obsolete. Spare parts cannot be obtained and the fuel consumption is wasteful as compared with the more recent types of vehicles. The Highways Committee therefore recommend that six four-ton petrol lorries suitable for breakdown purposes should be obtained at an estimated cost of £5,500.

INCREASE IN TRAMWAY FARES.—The Highways Committee submitted a long report dealing with the criticism which has been directed to the increases in fares which have recently been made on the Council's tramways. The Committee allude to the recent agreement with the National Transport Workers' Federation, by which a 48-hour week has been instituted and other concessions granted, involving an increased expenditure estimated at £360,000 a year. This is by no means the sole increase in wages for which the Council has to provide. In 1913-14 the total wages bill was £1,102,220, for operating 59,209,289 car miles. For the year 1919-20 it is estimated that the wages bill will be increased to £2,421,250 for a car mileage of 53,000,000. The price of coal and practically all materials has also advanced, in many cases more than 100 per cent. The Committee gave the following comparison for the past seven years :—

Year	Working expenses (including war service allowances), £	A Car Mile. d.
1913-14	1,585,251	6.50
1914-15	1,684,243	6.89
1915-16	1,683,660	8.44
1916-17	1,817,693	8.82
1917-18	2,128,685	10.38
1918-19 (estimated)	2,811,465	14.10
1919-20 do.	3,531,925	15.99

It is thus necessary for the Council to raise nearly £2,000,000 a year in order to cover the increased working expenditure. The Committee is satisfied that little can be done to effect further economies in working. Either fares must be higher or the tramways must become a charge on the rates.

TRAMWAYS AND IMPROVEMENTS BILL, 1919.—The Highways Committee reported that the Tramways and Improvements Bill has been refused by the Standing Orders Committee because it was presented too late for compliance with Standing Order 22. The delay in promoting the Bill was due entirely to war conditions, and the Council was given to understand that facilities would be granted for the favourable consideration of late Bills. In these circumstances it would be hard on the Council and the public if for technical reasons the Bill is not allowed to receive consideration by Parliament. The Highways Committee have enquired into the advisability of moving in the House of Commons for the re-committal of the Bill to the Standing Orders Committee in order that the decision may be reconsidered. There were precedents for this course, and in a few cases the decisions have been reversed. They recommended that every effort should be made to secure a re-committal of the Bill.

SUPPLY OF RAILS.—On May 27 the Council referred to the Highways Committee the tenders received for the supply of (1) about 2,000 tons of standard steel girder tramway track rails with fastenings, and (2) alternatively about 4,000 tons of standard track rails, lipless track rails and renewable guard rails with fastenings. The Committee now recommend that contracts should be entered into with Bolckow, Vaughan & Co., Ltd., for the supply of tramway track rails and fastenings.

OPENING OF TENDERS DURING WHITSUNTIDE.—The Highways Committee were authorised during the Whitsuntide recess to open any tenders involving capital expenditure over £500 which might be received for the supply of materials, etc., and for the execution of work.

On the minutes of the Highways Committee, Mr. Gilbert, M.P., asked the Chairman of the Highways Committee whether the Government offered the Council any motor lorries for passenger traffic or did the Committee apply for them. Mr. Squires, chairman of the Highways Committee, replied that as the Council at present had no power to run motor omnibuses, it was reasonable to assume they could not run motor lorries. Mr. Fell, however, was conferring with the President of the Board of Trade on the matter.

Mr. Gilbert also asked how many tramway men had been demobilised. Mr. Squires replied that 2,051 of the Council's tramway men had been released from war service since the Armistice. The number at present on war service and receiving war allowances was 407, of whom 47 were motormen and 129 conductors.

Replying to further questions, Mr. Squires said that by July 1st next it was anticipated that a number of additional cars would be available for service, and it was also hoped to arrange for the re-introduction of children's fares by the same time. As was stated in the Committee's report, the new fares and stages would be reviewed in six months' time.

MISCELLANEOUS NEWS AND NOTES.

1d. Fares in Edinburgh.—The Tramways Committee of Edinburgh Corporation proposed to continue the 1½d. minimum fare charged by the Cable Company on taking over the system, but the City Council, by a large majority, referred the matter back for reconsideration, with a view to establishing the 1d. minimum fare.

Glasgow Tramway Fares.—The question of an increase in fares at Glasgow has again been deferred owing to the Town Council being counted out on May 29 before the minutes of the Tramways Committee were reached. The recommendation to appoint a special committee to consider the whole question will not receive consideration until the next meeting of the Council on June 12.

Municipalising Tees-side Tramways.—The tramways system in the Tees-side district, owned by the Imperial Tramways Co., Ltd., of Bristol, is about to be taken over by the corporations of Middlesbrough, Stockton, and Thornaby-on-Tees, jointly. Formal notice has been given by the corporations, and Messrs. J. B. Hamilton and A. R. Fearnley, have been appointed valuers on behalf of the three corporations, while Messrs. Sellon and Partners are acting on behalf of the Imperial Tramways Company.

Greenock Tramway Strike.—After making a demand for £4 per week for men and £3 15s. for women, with a 48-hour week, the tramway employees of the Greenock and Port Glasgow Tramways Company struck work, the Company pointing out that the working arrangement between the Employers' Federation and the Amalgamated Association of Tramway and Vehicle Workers does not expire till the end of June. Negotiations, however, were entered into, and the men resumed work on Monday, June 2. The terms of settlement have not been disclosed.

A Correction.—In our last issue a paragraph headed "Alterations in Fares," was ascribed, by inadvertence, to Liverpool instead of Birkenhead. The report stated that, in response to complaints regarding the new fare charges, Birkenhead Corporation Tramways Committee put before the Town Council a recommendation that the fares on five routes be reduced. Appeals were made for the establishment of more short penny stages, but Mr. Halsall declared that they were impracticable, owing to the difficulty in collecting the fares. The Tramways Committee's recommendations were agreed to.

Sale of Auckland (N.Z.) Electric Tramways.—An extraordinary general meeting of the Auckland (N.Z.) Electric Tramways Company, was held in the Manchester Hotel, London, E.C., on May 30, to consider authorisation of the directors to sell the undertaking to the Auckland Corporation. Mr. Tegetmeier, who presided, said that the only satisfactory solution of the problems before them was the purchase of the undertaking by the corporation, which would relieve the Company from a burden of £30,000 a year, payable in New Zealand taxation. The purchase money was payable in corporation debentures, and the directors had decided to recommend the sale. The recommendation of the directors was unanimously accepted by the meeting.

Loop Lines to Reduce Congestion at Liverpool.—The pier head at Liverpool, which is the working centre of the tramway system, has been one of the most difficult points in organising the service, for practically every route converges on this space. The Reconstruction Committee have recently considered the question of improving the tramway facilities at the pier head, and have decided to recommend the reconstruction of three loop lines in order to relieve the congestion of traffic. The Tramways Committee have been requested to consider without delay the construction of a loop line connection at Church Street, Parker Street and other suitable points on the main lines in the city, with a view to making it unnecessary for so many cars to travel to the pier head. They hope later to undertake a scheme for the reconstruction of the pier head site. The whole scheme is to be drawn upon competitive architectural designs, and premiums of one thousand guineas, five hundred guineas and two hundred and fifty guineas will be offered by the Corporation.

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Depot Released.—The Leeds Corporation Tramway Depot at Swinegate, which has been used during the war for army clothing, will shortly be vacated by the military authorities. During the war the depot played an important part as the centre of the wholesale clothing trade for the Royal Army Clothing department. The depot houses some fifty cars, and its return to the tramways will, it is anticipated, relieve the congestion.

Track Repair Required at Salford.—At a meeting of Salford Town Council, Alderman Linsley, chairman of the Tramways Committee, alluding to the contribution from the tramways of £25,000 toward the rates, said that thirty miles of their sixty miles of track were in a very bad condition, and if the Corporation insisted on taking any large sum from the Tramways Committee fund, the Committee would have no alternative but to ask for a contribution from the rates for repairs.

Liability for Bad Roads.—At Sheffield County Court, on Thursday, May 22, a farmer sued Sheffield Corporation for £5 14s., damages for injury caused to a milk float brought about by the neglect of the defendants to keep in proper repair Abbeydale Road. In the course of his evidence, the plaintiff stated that, on August 31, 1918, owing to the approach of a motor lorry he was obliged to cross the road at a point where the track was bad. His cart wheel went into a hole, the wheel came in contact with the rail, the axle being broken and the wheel coming off. His Honour Judge Adshead Elliott awarded damages for the amount claimed and costs.

Nottingham Tramway Fares.—Mr. R. H. Swain, chairman of the Nottingham Corporation Tramways Committee, in presenting the annual report, said that the expenditure was £800 more than the total receipts for 1917. Ninety-two of the largest towns in the country had increased their fares, twenty-six of them a second time. The Nottingham fares were as low as those in other towns, and worked out at ¾d. a mile. It would be impossible to resume the penny stages until they could get more cars, as they would not be able to carry the passengers. Mr. Swain spoke highly of the war record of the tramways department. Twenty-two of their employees had lost their lives and other men were maimed. Two men had gained commissions, one the M.C., and one the M.M. There are still ninety men with the colours.

Proposed Increase in Argentine Tramway Fares.—The Anglo-Argentine Tramways Company and the Buenos Ayres Lacroze Tramway Company have applied to the municipal authority for permission to raise the fares from the present flat rate of 10 cents for any distance to 12 cents. To meet the coinage difficulty of a 12 cent fare, it is propoesd either that a new 7 cent. token should be issued or that tickets should be sold in books. The workmen's fares for the early morning and evening cars will be left at 5 cents. The increased cost of wages and maintenance made it necessary for the companies to earn a larger revenue. Although there may be some opposition, it is unlikely that the request of the companies will be refused. The increase will mean an addition of a million dollars to the revenue of the city, as 18 per cent. of the tramway takings go to the municipality under the companies' concession.

New Cars for Belfast.—A deputation of the Belfast Tramways Committee have recently visited a number of important tramways and some of the car building works, and on the advice of the manager, Mr. J. S. D. Moffet, they have recommended for adoption as the standard car a four wheel, double deck car, having a seating capacity of 26 inside and 42 outside, as against 58 in the present car. Councillor W. C. Turner, chairman of the Tramways Committee, stated to the Town Council that the new car will be more roomy and will have a totally enclosed top saloon and a platform vestibule for the protection of the motorman. The price of the new car will be about three times that of the old car. It will have a larger motor and be designed to take a trailer. The question of the purchase of fifty new cars of the type proposed, at an estimated cost of £130,000, has been referred to a special meeting of the Council.

Contract Fares at Blackpool.—Seldom has the raising of tramway fares caused such a ferment among the people affected as the proposed increase in the charge for contract tickets made by Blackpool Corporation. Curiously enough, there are few increases in tramway fares more evidently justifiable, so far as an outsider can judge. It appears that, early in the history of Blackpool Corporation Tramways, a system of yearly contract tickets was instituted, whereby anyone might travel over any part of the tramways system for the sum of £3 per annum. The measure was well-advised, for, on the one hand, it encouraged people to make their homes near the tramway line outside the town, and on the other hand the tramway system was small and in need of traffic. Now, however, the mileage of the Blackpool tramways is vastly increased, the cars are congested, and passengers who pay ordinary fares are charges out of all proportion to the amount paid by the holders of contract tickets. Anyone buying a contract ticket can travel for, say, about twopence a day, distances which cost ordinary passengers at least three times as much. Some alteration in that state of matters has long been overdue. It may be that the raising of the price of the contract ticket from £3 to £8 is just a little too sudden, and the outcry of the contract ticket holders is quite natural. Meetings have been held by the ticket-holders and their friends, protesting against what they regard as an outrage. To obviate grievance, Blackpool Corporation Tramways Committee instructed Mr. Furness, the general manager of the tramways, to draw up a scheme for contract tickets. The scheme, which provides for contract tickets graded from £4 to £8 per annum, for adults and £2 10s. for juveniles, according to distance, has been approved by the Committee.

Tramway Rails for Birmingham.—In the House of Commons on May 29, Commander Bellairs asked the President of the Board of Trade whether the Birmingham Corporation had placed an order for rails after tenders had been invited from British and American firms, and whether he would give publicity to all the large contracts placed abroad in order that data might be known when the Bill for the protection of key industries was introduced. Mr. Bridgeman (Parliamentary Secretary, Board of Trade), who replied, said: I am aware of the contract to which my hon. friend refers. I understand that it was entered into owing to the urgent necessity of reconstructing certain tramway routes which were in a very defective condition. The fact is that British manufacturers could not undertake delivery except at dates which would have prevented the work being completed this summer. In this connection I would point out that the heavy iron and steel industry is at present very fully occupied, and that there is considerable difficulty in meeting the demands upon it. The Board of Trade have no power to require information to be furnished to them as to contracts placed abroad.

FINANCIAL.

Brazilian Traction Co., Ltd.—The usual quarterly dividend of 1½ per cent. on the preference shares has been declared.

Siemens Brothers and Company, Ltd.—The report for the year 1918 shows that the profit is £229,647, and £134,920 was brought forward. A final dividend of 5 per cent. is recommended, making 10 per cent. for the year.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended June 4 amounted to £84,441, an increase of £17,332 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to June 4 (nine weeks and two days) the total receipts were £740,777, an increase of £181,002 on the corresponding period of 1918.

Glasgow Corporation Tramways.—The following are the traffic statistics for the tramways department for the year which closed on May 31st, compared with the figures for the previous year:—

	1918-19.	1917-18.	Inc. or Dec.
Track mileage (single)	196¼	196¼	
Car mileage	25,581,547	26,261,231	— 679,684
Traffic receipts ..	£1,527,487	£1,404,110	+ £123,377
Traffic receipts per car mile	14.331d.	12.832d.	+ 1.499d.
Per passenger ..	.790d.	.782d.	+ .008d.
Passengers carried ..	464,246,677	430,946,566	+ 33,300,111
Passengers carried per car mile ..	18.148	16.409	+ 1.739

The following statement gives the number of passengers carried at each fare:—

	Year to May, 31, 1919.	Year to May 31, 1918.
½d.	290,080,376	272,902,138
1d.	121,285,355	110,608,645
1½d.	31,750,977	28,462,112
2d.	10,348,905	9,332,956
2½d.	4,846,252	4,351,666
3d.	2,520,384	2,215,506
3½d.	2,952,145	2,696,504
4d.	462,283	377,039
	464,246,677	430,946,566

PERSONAL.

Mr. Stewart Robertson has resigned his position in the Aberdeen Corporation electricity department to accept the position of accountant of the Calgary Electric Power Company, of Alberta.

Mr. Frank Wood, borough engineer of Fulham, has been recommended for appointment to the position of borough engineer and surveyor of Blackpool, in succession to the late Mr. J. S. Brodie.

Bournemouth Manager's Salary.—The Tramways Committee has recommended the Bournemouth Town Council to increase the salary of Mr. I. Bulfin, tramways general manager, to £1,000 a year, rising by annual increments of £50 to £1,250.

Mr. E. S. Rayner, borough electrical engineer and tramways manager of Doncaster, has been granted an increase in salary from £550 to £700 for one year, and then to £750. Councillor S. Balmforth, chairman of the Electricity and Tramways Committee, said the traffic on the tramways was three times as great as it was in 1914, though they had not been able to increase the rolling stock. Councillor H. M. Marshall, who supported the recommendation, said that Mr. Rayner had recently proposed a plan for the extension of the system, involving an estimated expenditure of £40,000.

Leeds Manager's Salary.—The Leeds City Council has approved the recommendation of the Tramways Committee increasing the salary of Mr. J. B. Hamilton, the general manager, by £500, making his total annual salary as tramways and commercial manager £2,000. Alderman R. A. Smithson, chairman of the Tramways Committee, in moving the recommendation, said that Mr. Hamilton was appointed in 1902 at a salary of £900, increasing a year later to £1,000. The traffic receipts were then £220,000, while last year they were £723,000. The staff had increased from 1,000 to 2,200.

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CONTRACTS AND ORDERS.

H. Lotery and Company have an order from Sunderland Tramways Committee for uniforms.

Sunderland Tramways Committee have ordered 200 tons of rails from Bolckow, Vaughan and Company, Ltd.

Hadfields, Ltd., have received an order for 8 pairs of manganese steel points at £528 from Salford Corporation.

The Stirling Boiler Company's tender to Great Grimsby Corporation for the supply of boiler house plant, at £18,643, has been recommended to the Town Council for acceptance.

Walter Scott, Ltd., have received an order from Halifax Tramways and Electricity Committee for 500 tons of tramway rails at £17 15s. per ton, and 14 tons of fishplates at £21 17s. 6d. per ton.

The British Thomson-Houston Company, Ltd., Rugby, are to supply a 1,500 kw. rotary converter, transformer and switchgear to Halifax Corporation, at £7,486.

Ibbotson Brothers, Ltd., Sheffield, have an order from Halifax Corporation for 3 tons of fishplate bolts, at £46 per ton, and **Bayliss, Jones and Bayliss, Ltd.**, Wolverhampton, are to supply 9 tons of tie-bars at £39 per ton.

Glasgow Tramways Committee have ordered two 5-ton electric vehicles from Electromobile (Leeds) Ltd., and have made contracts for six months as follows:—Chilled iron brake blocks, Miller and Company; malleable iron castings, Alex. Shanks and Son, Ltd.; springs, L. Stern and Company, Ltd., and George Turton, Platts and Company, Ltd.

Leicester Tramways and Electricity Committee have accepted the tender of Messrs. Dick, Kerr and Co. for twelve canopy top, single truck cars of the Leicester type at £1,507 each, and for trucks and equipment for six others, at £820 per set, the bodies for which will be built in the department's shops, at an estimated cost of £4,122. An application is to be made to the Board of Trade for sanction to a loan of £27,000.

Liverpool to Apply for Increase in Statutory Maximum Fares.—The Liverpool Tramways Committee have requested the special Parliamentary Committee to include in the next application to Parliament a provision allowing the statutory limit of tramway fares to be raised to 1½d. per mile. The present rate is 1d. for two miles.

POSITION VACANT.

LIVERPOOL CORPORATION TRAMWAYS.

Motor 'Bus Foreman.

The Liverpool Corporation Tramways and Motor Omnibus Committee require the services of a qualified Mechanical Engineer, with a thorough knowledge of Building and Repair of Internal Combustion Engines, to act as Foreman in charge of a fleet of Motor Omnibuses and other motor Vehicles.

The applicant must have a sound technical knowledge, and experience in the supervision and control of men.

The person appointed will be required to devote the whole of his time to the duties of the position.

Particulars of the duties may be obtained on application to the General Manager, Mr. C. W. Mallins, A.I.E.E., M.I.A.E., Liverpool Corporation Tramways, 24, Hatton Garden, Liverpool.

Applicants to state age and salary required, with full particulars of experience, and enclose copies of not more than three recent testimonials.

Applications to be endorsed "Application for Motor Bus Foreman," and addressed to the Town Clerk, Municipal Buildings, Liverpool, and forwarded through the post so as to be received by him not later than the first post on Wednesday, the 11th June, 1919.

EDWARD R. PICKMERE,
Town Clerk.

Town Clerk's Office,
Municipal Buildings,
Liverpool, 27th May, 1919.

THE ENGLISH ELECTRIC COMPANY LIMITED.

Queen's House, Kingsway, London, W.C.2.

This Company, with a Capital of £5,000,000, has been formed to consolidate under one direction and management the various interests of the following companies, in all of which a predominating control exists:—

COVENTRY ORDNANCE WORKS, LTD.
DICK, KERR & CO., LTD.
PHŒNIX DYNAMO MANUFACTURING CO., LTD.
UNITED ELECTRIC CAR CO., LTD.
WILLANS & ROBINSON, LTD.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAME.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C. ..	Apr. 22	460	769	+ 309	3	1,880	—
Aberdeen Corporation ..	May 31	3,895	4,849	+ 1,454	52	139,512	+ 24,455
Ayr Corporation ..	„ 31	519	777	+ 258	2	1,292	+ 526
Belfast City	„ 30	7,732	11,350	+ 3,618	9	91,103	+ 22,036
Birkenhead Corporation	June 1	2,250	3,008	+ 758	8½	22,491	+ 3,532
Birmingham Corporation	May 24	27,774	28,275	+ 501	8	204,069	+ 25,442
Birmingham Motor Buses	„ 24	2,146	2,040	— 106	8	13,237	+ 1,526
Blackburn „ ..	„ 28	1,877	2,414	+ 537	9½	21,542	+ 4,675
Bradford Corporation ..	„ 31	8,483	11,365	+ 2,282	9	99,116	+ 27,709
Burnley Corporation ..	„ 31	2,235	2,979	+ 744	..	..	..
Burton-on-Trent Cor. ..	June 1	400	483	+ 83	9	4,123	+ 607
Bury Corporation ..	„ 1	2,619	2,499	— 120	8⅔	21,679	+ 3,576
Chatham & District ..	May 22	1,666	1,657	— 9	20	26,993	+ 2,454
Cork Electric	„ 22	708	705	— 3	20	11,564	— 557
Derby Corporation ..	„ 31	1,535	2,089	+ 554	9	15,810	+ 2,501
Dundee City	„ 28	1,940	2,389	+ 449	1⅔	4,296	+ 688
East Ham Corporation ..	„ 31	1,441	2,049	+ 608	8⅔	16,759	+ 4,614
Glasgow Corporation ..	„ 31	31,072	35,176	+ 4,104	52	1,527,488	+ 123,378
Glossop (U.E. Sup. Co.) ..	„ 31	212	226	+ 14	22	4,848	+ 821
Halifax Corporation ..	„ 27	2,904	3,563	+ 659	8½	28,490	+ 5,467
do. Motor Buses ..	„ 27	61	73	+ 12	8½	636	+ 129
Huddersfield Corporation	„ 31	3,863	4,812	+ 949	9	42,838	+ 8,906
Ilford U.D. Council ..	„ 31	998	1,247	+ 276	9	10,684	+ 2,233
Ipswich Corporation ..	„ 31	767	849	+ 82	9	7 266	+ 958
Isle of Thanet ..	„ 31	285	1,001	+ 716	34⅔	15,356	+ 8,544
Kilmarnock Corporation	„ 31	223	275	+ 52	2⅔	733	+ 136
Lanarkshire	„ 22	3,978	4,045	+ 67	20	63,716	— 4,866
Leeds City	„ 31	12,415	17,240	+ 4,825	9	145,000	+ 42,000
Leicester Corporation ..	„ 31	4,613	5,983	+ 1,370	..	..	..
Leyton U.D. Council ..	„ 29	2,114	3,233	+ 1,119	9	27,323	+ 9,065
Liverpool Corporation ..	„ 31	18,888	23,360	+ 4,472	21½	456,951	+ 84 467
Llandudno & Colwyn Bay	„ 16	367	523	+ 156	24	8,556	+ 1,878
London County Council ..	June 4	67,109	84,441	+ 17,332	9⅔	740,777	+ 181,002
Maidstone Corporation ..	May 29	254	355	+ 101	8⅔	3,228	+ 765
Manchester Corporation	„ 31	24,366	30,947	+ 6,581	9	269,005	+ 50,268
Newcastle-on-Tyne Cor.	„ 31	9,205	9,575	+ 370	9	80,198	+ 1,943
Northampton Cor. ..	„ 22	1,138	1,275	+ 137	8	9,584	+ 2,442
Nottingham Corporation	„ 29	5,811	7,096	+ 1,285	9	60,340	+ 11,229
Oldham Corporation ..	June 1	4,272	4,931	+ 659	10	42,392	+ 7,647
Reading Corporation ..	May 29	1,302	1,634	+ 332	8⅔	13,032	—
Rotherham Corporation	„ 28	2,257	2,247	— 10	8⅔	19,097	+ 1,505
Sheffield Corporation ..	June 1	13,942	17,213	+ 3,271	9½	164,536	+ 33,156
Southampton Cor. ..	May 28	2,468	2,773	+ 305	8⅔	22,422	+ 1,399
Southend-on-Sea Cor. ..	„ 21	1,604	1,828	+ 220	8	12,453	+ 5,865
South Shields Cor. ..	„ 21	1,116	1,421	+ 305	7	9,409	+ 2,298
Sunderland Corporation..	„ 17	2,089	2,948	+ 859	9	25,363	+ 6,363
Swindon Corporation	„ 14	280	335	+ 55	6¾	2,031	+ 180
Torquay Tramways ..	„ 22	1,172	1,090	— 82	20	17,184	+ 2,105
Tyneside Trys. & Trmrds.	„ 21	1,781	1,047	— 734	21	18,533	— 377
Wallasey Corporation ..	„ 31	1,934	2,644	+ 710	8½	21,732	+ 5,975
Walsall Corporation ..	„ 31	1,154	1,369	+ 215	9	12,468	+ 1,483
Walthamstow U.D. Coun.	„ 31	1,550	1,858	+ 308	9	15,793	+ 3 121
Warrington Corporation	„ 29	742	862	+ 120	8	7,561	+ 1,264
West Ham Corporation	„ 29	4,183	5,745	+ 1,562	9⅔	46,433	+ 10,855
Wolverhampton	June 4	1,717	2,019	+ 302	..	..	..
do. Motor Buses	„ 4	195	255	+ 60	..	..	..

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District, Tramways (M.E.T.) Omnibus Co., Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	May 27	£54,989	£65,786	21	£1,231,041	+ £68,612
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,832
Ballarat and Bendigo (4 wks)	Mar.	3,803	3,051	48	42,131	+ 1,444
Brazilian Traction (Mrs.)	Mar.	8,094,000	9,330,000	13	25,824,000	+ 2,578,000
Brisbane	Apr.	35,530	32,775	17	151,110	+ 13,541
British Columbia .. $	Mar.	510,892	649,120	39	5,390,119	+ 894,848
Buenos Aires Lacroze ..	Apr.	41,643	43,007	43	434,186	+ 46,122
Burmah Tram. & Light Rs.	Apr. 30	27,614	36,815	30	325,985	+ 86,230
Calcutta .. .. Rs.	May 24	71,303	83,720	20½	1,746,109	+ 241,797
Cape Town	Apr.	19,011	22,564	..	..	..
Carthagena and Herrerias	May	5,027	3,226	21	13,418	— 9,167
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	Apr.	1,791	1,920	39	17,518	+ 5,261
Hong Kong.. .. $	Apr. 12	10,880	13,291	15	211,651	+ 9,103
Kalgoorlie	Jan.	2,522	2,562	4	2,562	+ 40
La Plata	May	5,105	5,702	22	29,352	+ 4,274
Lima	Mar.	42,076	50,716	13	142,160	+ 1,4602
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	May 15	42,003	46,625	19	318,193	— 44,534
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	+ 83,959
Manila .. .. $	Mar.	172,750	207,792	13	650,745	+ 142,993
Montevideo	Apr.	33,704	37,014	26	227,905	+ 21,868
Para	Apr.	24,745	25,342	21	122,927	+ 3,761
Pernambuco	May 25	4,300	5,725	20⅔	112,588	+ 16,897
Peruvian .. .. $	Feb.	925,410	943,470	34	7,973,885	— 229,195
Port Elizabeth	Apr.	4,028	5,576	...	...	...
Rangoon	Apr.	5,885	6,217	17	25,817	+ 2,954
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore .. .. $	Mar. 15	14,161	16,307	11	178,525	+ 31,018
Toronto .. .. $	Mar.	1,113,472	1,083,285	13	3,205,922	+ 42,198
Winnipeg .. . $	Mar.	307,289	384,937	13	1,146,638	+ 205,808

WANTED.

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SATURDAY, JUNE 14, 1919.

AN EXPERIMENT IN DISCIPLINE.

It is reported from a populous centre, where the Labour element has great influence in the local public life, that an arrangement has been proposed whereby the tramway workers shall be disciplined, in the last resort, by their own union. At present, the scheme is not fully matured, but the principle involved is so important that it is worth noting. Should the manager of a tramway suspend or dismiss a man for any offence, he and his fellow employees may appeal to the Executive of the Amalgamated Association of Tramway and Vehicle Workers for judgment on the case. If the Union Executive decides that the man is to be reinstated or the penalty remitted, and the manager is unable to accept the decision, the case is to be taken before the Tramway Committee, whose judgment will be final. This proposal opens up a wide prospect. Hitherto, the strike has been the chief argument of the men's union, but it is impossible to imagine that the Amalgamated Association of Tramway and Vehicle Workers would call a strike to enforce their judgment in every petty case. If the scheme were adopted generally, the number of cases would preclude such a possibility, unless the tramwaymen's union had resolved on ruining themselves and the tramway industry. But tramway authorities would have to consider the fact that the forces behind such decisions are formidable. There is another consideration which has not been sufficiently impressed on the rank and file of tramway workers, and that is the fact that discipline must be maintained on a tramway system if it is to work at all. If the tramway workers obtained possession of all the tramway systems in the country to-morrow, the need for discipline in the services would not be less than it is now. Operations so dependent upon regularity, punctuality, co-ordination, and order, must be guided by some authority armed with power to enforce its decisions. By automatic clocks for timekeeping and other devices, the personal element in control has been greatly reduced, but the ultimate and only efficient controller is a competent man. Workmen are taught by simple experience that their own efficiency, if not safety, depends largely upon the guidance of a competent leader or manager or captain, whose commands are to be obeyed. Where men are combined in any operation, they must have someone to give the signal for united action, or else the strength of each will be dissipated in useless effort. On the other hand, it may be that some tramway authorities have to be reminded that the time is Mid-day democracy. Workers claim freedom which does not mean anarchy but ordered voluntary obedience to the just claims of duty. "Educate your masters," said Robert Lowe, when the Household Franchise Bill was passed in 1868, and that his advice was neglected we know too well. Educate your employees is an advice to those in authority in the tramway industry which might be taken in good part. If the scheme referred to helps to educate the workers in the necessity for and practice of discipline, it may prove of great service to all concerned.

LONDON TRAFFIC INQUIRY.

The Select Committee of the House of Commons appointed to inquire into the congestion of London passenger traffic sat again on Thursday morning, Mr. Kennedy Jones presiding.

Mr. F. L. D. Elliott, Assistant Commissioner of the Metropolitan Police, gave evidence as to the police powers in dealing with traffic, and spoke in favour of the setting up of a central traffic authority. He stated that under the law motor omnibuses were licensed for a given number of passengers and that number might not be exceeded. Tramway cars might carry passengers additional to the specified numbers during holidays, inclement weather and on special occasions. As an emergency measure, the Commissioner had sanctioned the carrying of an unlimited number of extra passengers in the lower saloons of tramway cars and five extra passengers in the interior of the omnibuses. The present crowding of vehicles was illegal, but was permitted in the interests of the public. Overcrowding was unpopular, and representations had been received from the Licensed Vehicle Workers' Union, pointing out that the overcrowding made the work of their members very hard. He thought that the public, however, looked on overcrowding as a secondary matter. What they wanted was to get to their destinations even at the cost of certain discomfort. Under the London Cab Act of 1907 the police had powers to fix the stopping places of motor omnibuses, but they had no power to prevent omnibuses from stopping between the fixed points. He thought it would be an advantage if there were some authority which should have power to regulate the omnibus routes, but successive Commissioners of Police had expressed the opinion that they would not like to have that power. After the witness had dealt with the taxi-cab regulations, in reply to a question he said that while it would require a great deal of consideration, the use of trailers with motor omnibuses might be worth considering. The police had always been against trailers on tramcars on the ground of public safety. The witness could, however, produce no tangible statistics to show whether their experience justified the objection of the police. Mr. Lyndon Macassey, Secretary to the Royal Commission on London Traffic, 1903-6, gave evidence in the afternoon. He said that the Commission found that the streets in London had not been constructed on the lines of development controlled on the basis of any definite plan. The same defect existed in railways and tramways. In a nutshell, that was the cause of the whole of the present trouble. The Commission were of opinion that the traffic problem should be dealt with as one individual whole, and that it could only be so dealt with by one authority with sufficient power. So far as the present was concerned, he thought that the difficulties could be solved by further means of locomotion and by the immediate formation of a traffic board. He would suggest that without delay an Act of Parliament should be passed for setting up a Traffic Board with complete powers. There must be some basis of partnership between the local authorities and the companies. Any traffic board to be effective must have a "good punch"; persuasion and suggestion would not go far enough. The veto of the local authorities should be eradicated. The Traffic Board should exercise the power of fixing fares to obtain something like uniformity.

Mr. G. H. Hume, Chairman of the Highways Committee of the London County Council from March, 1914, to March, 1919, said the Council worked the largest system of tramways in the Kingdom. The number of passengers carried for the year ended March, 1919, was 636,157,361, an increase of 114,000,000 passengers as compared with the year ended March, 1914. They did not want to make any profit out of the tramways, but their policy was that the tramways must be kept off the rates. Hitherto they had been able to make both ends meet because of the extraordinary increase in the number of passengers. Concessions to the employees had cost about £360,000. Working costs per car mile had more than doubled since 1913-14. It was then 6½d.; this year it was estimated at 15.04d. They had found it necessary to increase the fares, and the restoration of the old fares must depend entirely on the financial position of the undertaking. As long as it was self-supporting the travelling public would have the benefit of any reduction that was possible. Speaking of the abolition of the veto, Mr. Hume said that in 18 years the Council had only obtained powers for the construction of 51 miles out of 180 miles of tramway applied for. He thought the time had come when the abolition of the veto of local authorities must be considered. The Council wished to be at liberty to extend the trailer system.

The Committee adjourned until Tuesday morning.

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MISCELLANEOUS NEWS AND NOTES.

London Transport Committee.—Mr. C. F. Higham has retired from the Select Committee on Transport (Metropolitan Area) and Mr. E. A. Strauss has been added to the Committee.

Municipal Motors for Bradford.—Bradford Water Committee is to purchase a motor car for visiting works, and a 2-3 ton motor lorry for the general use of the department.

Sunday Service at Swindon.—The Town Council of Swindon has decided, by the casting vote of the Mayor, to resume the Sunday service of tramway cars suspended during the war.

Motor Omnibus Question at Ilford.—The manager of the Ilford Council tramways, Mr. L. E. Harvey, has been asked to report on the suggestion that the Council should run motor omnibuses.

Transport Labour Combination.—At the annual conference of the Associated Locomotive Engineers and Firemen, the agreement made by the Executive with the London and Provincial Union of Licensed Vehicle Workers to combine forces, was ratified.

Car-Shed Extension at East Ham.—In order that the necessary extensions may be made to the car sheds, East Ham Borough Council has instructed the borough engineer to draw up plans and estimates for the work, expenditure to be limited to £2,000.

Repairs at Gateshead.—Repairs, which it is estimated will cost between £15,000 and £20,000, are being carried out on the Gateshead Tramways Company's lines, under the supervision of Mr. W. Morrison, the general manager.

Mechanical Brakes for Aberdeen Tramcars.—Aberdeen Corporation Tramways Committee has accepted the recommendation of Mr. Forbes, general manager, that mechanical brakes should be put on the cars.

Municipal Omnibuses at Wigan.—A municipal motor omnibus service has been started at Wigan. One councillor has expressed the hope that it will be the beginning of an extensive fleet of motor omnibuses.

Free Rides for Disabled Men. Nottingham Corporation proposes to give free tramway passes to all crippled or blinded soldiers or sailors. The passes will be granted annually, and will bear the photograph of the owner.

Halfpenny Fares Discontinued at West Bromwich. The South Staffordshire Tramways Company have given notice to discontinue the halfpenny fares, as they have found it impracticable to continue them owing to the increased cost of up-keep and wages.

Proposed Portsmouth Extensions.—Portsmouth Tramways Committee has discussed the extension of the system, and it is expected that certain portions of the work will be proceeded with at an early date. Twelve double deck cars have been ordered from Messrs. Dick, Kerr and Company.

Tramway Extensions.—Southampton Tramways Committee has recommended the promotion of a Bill in the next session of Parliament for powers to construct tramway extensions.—The Board of Trade has consented to South Shields Council borrowing £10,000 for tramway extensions.

"Lorribus."—The *Daily Graphic* has discovered that "the motor-lorries are uncomfortable vehicles," and hopes that the period of their stay will be limited. The public, however, appreciate the addition to metropolitan facilities, and naturally question why the new conveyances were not long ago utilised.

Trolley Wire Renewal at Leicester.—Mr. T. Robert Smith, engineer and manager of Leicester Corporation electricity department, in his report for the year 1918, remarks that, owing to restrictions on copper it was impossible to renew the trolley wire in many places that require it, and about two-thirds of the whole tramway system needs renewing at an early date.

Glasgow Fares.—As the annual report for the year ended May 31 shows a large increase in receipts, it is probable that the proposal for the increase in Glasgow tramway fares, including the abolition of the halfpenny fares, will be deferred. The number of passengers at halfpenny fares for the past year was over 290 millions, and the traffic receipts per car mile increased from 12.83d. to 14.33d.

New Transport Co., Ltd.—The following meetings have been arranged by the New Transport Company, Ltd., and will be held at Caxton Hall, Westminster, S.W.1. On Monday, June 30, at 8.30 p.m. Mr. A. W. Gattie will speak on his system of cheap transport. On Monday, July 7, at 8.30 p.m., Mr. Roy Horniman will speak on the Transport and Housing Bills.

No Payments by Results.—The Executive Council of the Amalgamated Society of Carpenters and Joiners are determined that for the future it shall not be said that any member of the organisation is not a plain time worker. The Executive has decided that members everywhere must obey the instructions of the Society or sever connection with it.

Fine for Obstructing a Tramway Car. At Gateshead Police Court, on June 2, a carman was fined 13s. for having wilfully obstructed a tramway car by driving a horse and cart on the tramway lines. A tramway inspector stated that the driver refused to go on one side of the road, and thus impeded the progress of the car for some distance.

Suggested Extensions at Colne.—Speaking at a special meeting of Colne Town Council called to deal with the borough rate assessment, Alderman Hewitt-Dean stated that the actual loss on the tramways last year was £3,139, the loss being largely due to the increased wages paid to employees. Advocating a progressive policy in regard to the tramways, the alderman suggested extension of the undertaking to Earby and Barnoldswick, these two places seeming to offer promising fields of enterprise.

Quality of Imported Rails.—At the meeting of Birmingham City Council on June 3, Alderman Bewlay enquired whether the American rails had yet been delivered, and if so, whether they had been properly tested mechanically and chemically. Mr. F. Smith, who presented the Tramway Committee's report, replied that a large quantity of the rails had been received, the remainder were on the way, and they had been examined and found to be of first-class quality and up to specification.

Charges for Special Cars.—At the recent meeting of the Electricity and Light Railways Committee of Gloucester City Council, the General Manager of the tramways department brought forward the question of the charges which should be made for special cars, and asked for the Committee's instructions. The Committee decided to increase the charge per car from 20s. to 30s. when used for adults and from 10s. to 15s. when used for school children, travelling within the city, and from 12s. to 20s. when used for school children travelling beyond the city boundary.

Govan Tramwaymen Honoured.—At the Govan tramway depot of the Glasgow Corporation tramways, Mr. James Dalrymple, the general manager, recently presented gold watches, on behalf of the Govan employees, to five Govan men who had won military honours. These recipients were: Messrs. H. A. Herd, D.C.M.; J. Anderson, M.M.; W. Borthwick, M.M.; J. Gemmill, M.M.; and J. Malcolm, M.M. Another employee, conductor Jas. Young—who was awarded the Russian Order of St. Stanislaus—has since died, and a gold watch was presented to his son.

Electric Railways for Jamaica.—A correspondent of the *Morning Post* at Kingston has stated that the Government of Jamaica are arranging to have a survey made of the water power of the large rivers, to see if the electrification of the railways is feasible. The heavy cost of coal and the necessity of considerable railway extension makes the proposed change desirable. A local agent of the Westinghouse Company of New York is reported to be collecting data on which the Westinghouse Company might tender for the construction of electric railways.

South London Tramway Conductors.—A meeting of the South London tramway conductors and demobilised soldiers protested against the continued employment of women conductors by the London County Council, as it was alleged that there are demobilised men waiting for the jobs. It was stated that during the war 1,500 women were employed on the cars and that 500 of these are still retained. As the women belong to the union and Scotland Yard are said to be still issuing licences, the matter is not so simple as the men seem to think.

Outside Passengers on Dover Tramcars.—Since the serious accident which occurred on the Dover Corporation Tramways, in 1917, the Board of Trade had forbidden the carrying of outside passengers on the cars. Grave inconvenience has been caused to Dover people and visitors by the restriction, and representations have been made to the Board of Trade showing why the regulation should be abrogated. The result is that the Board of Trade has now sanctioned the carrying of outside passengers on the Dover tramcars.

Proposed Scale of Edinburgh Fares.—At a meeting held on June 4, the Tramway Committee of Edinburgh Town Council considered and approved a revised scale of car fares. Instead of the present minimum fare of 1½d. for a mile, a penny stage of 1,442 yards is proposed. This will leave the 1½d. transfer, the 2d. and 3d. fares precisely as they are. Children and workmen will travel at half-fare, but the minimum for the latter is 1d. The Committee decided to apply to the Board of Trade for power to introduce penny stages of less than the statutory mile.

Accident to a Woman Conductor.—A singular accident occurred to a woman conductor on the Preston tramways recently. When changing the trolley of a car the tension springs lifted her off the ground. When she was about 3 ft. in the air the trolley rope broke, and she fell to the ground, injuring her back; but she was able to proceed to her home. This accident resulted in a deputation from the tramwaymen's union requesting that the Tramways Committee should no longer employ women conductors. The Committee has recommended that suitable notice should be given to the women so as to enable them to obtain other employment.

Suggestions Invited for London Traffic.—Mr. Kennedy Jones, chairman of the Select Committee on Transport, invites those who may think they can advantageously lay suggestions of a practical character before the Committee to communicate with the Secretary, Transport (Metropolitan Area), House of Commons, S.W.1. He promises that any idea which offers practical possibilities will receive the fullest consideration at the hands of the Committee. Various labour organisations engaged in the transport industry have been asked if they have any recommendations to make or evidence to offer.

A Strike at Wallasey Averted.—After a long conference with the representatives of the employees, the threatened strike of Wallasey tramway men was averted. It was decided that a youth who had been dismissed should not be reinstated, and that the question as to hours of duty should receive prompt attention. The terms of the settlement also include a provision that in the event of a deputation appearing before the general manager, the employees shall have the right to appeal to the Tramways Committee, provided that the subject matter of the appeal shall be first submitted to the chief officials of the Amalgamated Society of Tramway and Vehicle Workers. The Tramways Committee has undertaken to consider at their next meeting the formation of a Works Committee in accordance with the Whitley scheme.

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Mr. McElroy on Women's Tramway Work.—Tramway managers have their own opinions of the relative value of female as compared with male labour in tramway operation, but they mostly prefer to keep their opinions to themselves. Mr. McElroy, general manager of Manchester Corporation Tramways, has put aside inappropriate scruples, and in giving evidence to the Committee on Women in Industry exhibited the actual facts of his experience without bias. In conclusion he stated that while acknowledging that the municipal tramways could not have "carried on" without the women, he regretted he could not find one point in which they were superior to men for tramway work.

Lights on Vehicles.—In reply to a question by Mr. Joynson-Hicks, Dr. Addison said that any modification of the regulations of lights on vehicles would be a matter for the Home Secretary, by whom the regulations were made. The consideration of permanent regulations for lights on motor vehicles which came into operation upon the Defence of the Realm regulations ceasing to operate, is not being proceeded with pending the passing of the Ministry of Ways and Communications Bill. Consideration of the recommendations of the Departmental Committee on road locomotives and heavy motor cars is also deferred.

Plymouth Tramways Manager.—The Tramways Committee of Plymouth Corporation, at a meeting held on June 4, resolved to issue advertisements for a wholetime officer at a commencing salary of £700, rising by annual increments of £50 to £800, candidates to have experience as engineer and manager of a tramway undertaking, the duties to include the management of the building and repairing of car bodies, trucks, and electrical equipment, the construction and maintenance of the permanent way and overhead lines, together with the control of the whole of the employees of the department.

Women Employees at Newcastle.—Since the demobilisation the number of women employed on the Newcastle cars has been reduced from 400 to 250. All the men have returned from the forces with the exception of about 100, who have not yet been demobilised. The Newcastle branch of the Amalgamated Society of Tramway and Vehicle Workers have passed a resolution demanding that all women who now occupy positions held by men prior to the war be dispensed with by July 1, 1919. Every tramway worker, however, who has returned from service with the colours has been given a position, and the employees have evidently misunderstood the facts. Many of the women have done good service on the cars since April, 1915.

Char-á-banc Competition.—At Worthing Corporation Licensing Committee a letter—received from the Southdown Motor Services, Ltd., stating they had heard that a London firm had made application to license chars-á-bancs in Worthing, but that the Southdown Motor Services Co. were prepared to supply as many chars-á-bancs as the public require as soon as they can get delivery of new chassis and asking the Committee to consider the claims of large ratepayers like themselves in preference to those of outsiders—was submitted. The Committee decided that the company be informed the Committee have received applications from two owners of chars-á-bancs from other towns which will be considered in the ordinary way, and that the question as to whether licences should be granted is a matter for decision by the Council on each application.

Holiday Omnibus Traffic at Sheffield.—A notable feature of the heavy Whitsuntide traffic in the Sheffield district was the large use which was made of motor omnibuses and, in fact, motor vehicles of every description. As the *Sheffield Telegraph* aptly described it, "any old thing on wheels was brought into service for the holidays," and chars-a-bancs in private ownership were to be seen on all the main roads in the district making their way into the beautiful parts of Derbyshire. The Sheffield Corporation motor omnibuses rendered a largely increased service, 10 new vehicles having been obtained during the past few weeks and the receipts for the four days, Saturday to Tuesday, amounted to £1,569. There is no doubt that given a reasonable price for petrol, which would reduce the working costs by 3d. per mile, there is a great amount of work to be done in the Sheffield districts by the extension of motor omnibus routes from the tramway terminal points to the outlying districts.

Whitsun Traffic.—The superb weather of the Whitsun holidays and the high railway fares combined almost overwhelmed the local transport facilities. On one day the Underground railways carried 1,215,552 passengers. The tramcars and omnibuses on some routes were insufficient to carry all the people who desired to travel. The traffic receipts of the Leeds Corporation tramways for the Saturday, Sunday and Monday amounted to £10,742, and for the corresponding three days of last year the receipts were £7,742. At Bradford the receipts for the three days were £6,744 as compared with £5,147 for the same period last year, while at Halifax the receipts were £2,841 as compared with £2,467 last year. Newcastle showed an increase on Saturday over Whit Saturday of last year, the totals being £2,006 and £1,918, but there was a decrease for Sunday, for which the figures were Whit Sunday, 1918, £1,177; Whit Sunday, 1919, £1,105. Burnley's figures were: Saturday, 1919, £806; 1918, £574; Sunday, £445 this year; last year, £353; Monday, £904 and £759 respectively. Wolverhampton receipts were £840 for Whit Monday, being an increase of £200 on the figures for Easter Monday. Manchester tramway receipts for the three days showed a gain of £1,191 over last year, the total being £14,549. Birmingham took £608 on Monday alone, and other tramway systems showed increases over all, though in some cases there have been decreases in Sunday traffic.

FINANCIAL.

Yorkshire (West Riding) Electric Tramways Co.—The directors have decided to pay on July 1 an interim dividend of 3 per cent., being at the rate of 6 per cent. per annum, on the 6 per cent. cumulative preference shares for the half year ending June 30, 1919.

British Electric Traction Co.—The directors have decided to place about £20,000 to reserve, and to recommend the payment of a dividend on the 6 per cent. cumulative participating preference stock and a dividend of 3 per cent. (the same rate as last year), on the ordinary stock, and to carry forward £112,116, an increase of £18,836.

Bolton gets £14,000 from Tramways. On the report of the Tramways Committee, granting £14,000 from the tramway profits in relief of rates, submitted to Bolton Town Council, it was moved that the matter be referred back, because it seemed unfair to the department. Councillor Horrocks, on behalf of the Tramways Committee, defended the proposal, stating that Bolton tramways undertaking could well afford to make the grant.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended June, 11, including the Whitsun holidays, amounted to £92,615, an increase of £27,311, as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to June 11 (ten weeks and two days) the total receipts were £833,409, an increase of £208,331 on the corresponding period of 1918.

Tramways (M.E.T.) Omnibus Company shows a profit—after providing for debenture and loan interest, placing £6,373 to debenture redemption fund and writing off preliminary expenditure, £4,385—of £35,028. Including £1,028 brought forward there is an available sum of £36,056. A dividend of 2s. per share has been declared, and £15,000 has been transferred to reserve, leaving £10,053. In 1907 the dividend was 4s. per share.

Birmingham District Power and Traction Co.—The net revenue for the past year from the tramways and from investments amounted to £96,672. Aftr deducting administration and general expenses, payment to local authorities and employees' benefit fund, etc., there was a surplus of £79,185. The reserve is increased by £6,297, and the dividend on the ordinary shares is to be raised from 5 per cent. to 6 per cent. The carry forward is a trifle lower at £6,030. The debenture trustees have purchased and cancelled £8,672 of debenture stock, and £40,000 second debenture stock was issued during the year for the purpose of assisting the financial arrangements of the Shropshire, Worcestershire and Staffordshire Electric Power Companies, in which the Birmingham Company have large investments.

Nottingham Corporation Tramways.—The following is a summary of the report for the year ended March 31, 1919. For comparison the figures for the three preceding years and for the pre-war year are also set out.

Year ended March 31.	1919.	1918.	1917.	1916.	1914.
	£	£	£	£	£
Total revenue	307,904	238,867	203,155	195,392	175,379
Working expenses	203,916	155,484	138,717	121,266	108,422
Profit on working	103,988	83,383	64,438	74,126	66,957
Interest ..	16,063	16,639	16,495	16,452	14,124
Sinking fund	8,571	8,459	8,459	8,459	8,132
Repayment of loans ..	15,715	15,715	15,715	15,714	12,138
Nottingham Corporation Bill	—	—	—	—	550
Net profit ..	63,639	42,570	23,769	33,501	32,013
Contributions to rates ..	30,000	16,000	10,000	20,350	24,000
Reserve fund	33,639	26,570	13,769	13,151	8,013
Passengers ..	46,415,421	52,690,881	47,480,934	45,741,208	40,535,874
Fare per passenger ..	1.57d.	1.07d.	1.02d.	1.01d.	1.02d.
Car-mileage ..	3,572,973	3,776,275	3,766,411	3,885,322	3,543,669
Units per car-mile ..	1.81	1.79	1.70	1.64	1.51
Power cost per car-mile	3.02d.	2.62d.	2.39d.	2.25d.	1.89d.
Receipts per car-mile ..	20.68d.	15.18d.	12.94d.	12.06d.	11.87d.
Expenses per car-mile	13.70d.	9.88d.	8.44d.	7.49d.	7.34d.
Ratio of Expenses	66.22%	65.09%	68.28%	62.10%	61.82%
Total track mileage ..	44.25	44.25	44.25	44.25	37.40
Number of cars in stock ..	155	155	155	155	135

PERSONAL.

Mr. E. E. Hoadley, electrical engineer of Maidstone, has been granted an increase in salary to £769 per annum.

Mr. F. W. Purse, electrical engineer of Carlisle Corporation, has been appointed engineer and manager to the West Ham Corporation.

Mr. T. A. Kingham, who has been acting electrical engineer of the Kingston-on-Thames Corporation, has been appointed borough electrical engineer.

The women conductors of Sheffield Corporation tramways have made presentations, "in recognition of many kindnesses shown," to **Miss Plumb** and **Mr. Richard Hoggard,** the officials who have had charge of the women staff of the Sheffield Corporation tramways for the past four years.

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Ex-Private G. A. Pudnay, of Tottenham, who wears the Mons ribbon, a conductor of a London tramway car, jumped from his platform on to a cart, climbed over a load of boxes, and sprang on to the neck of a horse which was running away, ultimately bringing it to a standstill.

Messrs. Stephen Sellon and Partners, of 36, Victoria Street, London, S.W., have been appointed engineers to the Dearne District Light Railways Joint Committee, who hold an order for the construction of fifteen miles of light railways in the West Riding of Yorkshire.

Capt. Ernest E. Sharp, who is known to most tramway managers in connection with his advocacy of the use of meters on tramcars as an antidote to bad driving, has now been demobilised from the Army after three years' service, much of it in France. He is relinquishing his position with Messrs. Chamberlain and Hookham in order to start a new enterprise which will appeal to tramway managers. At the moment he is not able to furnish particulars, but will do so shortly. Meanwhile, his address is 109, West Side, Clapham Common, London, S.W.4, where he will be pleased to receive any communications from old friends.

CONTRACTS AND ORDERS.

Bolton Tramways Committee have ordered two chassis made by the Associated Equipment Company for the tower wagons.

Wigan Corporation has accepted the tender of the English Electric Company for bodies for three single deck motor omnibuses; the chassis will be supplied by the Daimler Company.

Birmingham Electricity Committee has recommended the acceptance of the tender of the British Thomson-Houston Company for two 15,000 k.w. turbo-alternators for the new Nechells station.

South Shields Omnibuses. The Tramways Committee of South Shields Corporation has accepted the tender of the Daimler Co., Coventry, for the supply of two petrol chassis at £950 each.

Motor Lorries wanted at Burton. Burton-on-Trent Corporation has authorised the borough surveyor to purchase two motor lorries for the Highways Department.

South Shields Electrics. The Local Government Board has sanctioned the borrowing by the South Shields Corporation of £1,450 for the provision of a boosting station for the supply of electricity to the Council's electric refuse vehicles.

New Tramcars for Dover. Last week the Sub-Committee of Dover Corporation Tramways Committee presented a report, recommending that the offer of Dick, Kerr and Co., Ltd., for three new cars, to cost a total of £6,000, be accepted.

Electric Motor Vehicle for Sheffield. Sheffield Corporation are asked to make a supplementary grant of £1,000, to the Weights and Measures Department, for the purchase of an electric motor vehicle to replace the two-horse van used in connection with the testing of weighing machines.

New Cars for Portsmouth. In their report to the Town Council, the Tramways Committee of Portsmouth Corporation stated that the following tenders were received for the supply of 12 new cars, namely: Messrs. Dick, Kerr & Co., complete in accordance with specification, £1,930; The Brush Co., body and truck, £1,410. Delivery of the cars could probably be obtained from Messrs. Dick, Kerr & Co., in about 3 months. They recommended that an order be placed with Messrs. Dick, Kerr & Co. for 12 cars complete in accordance with their specification and quotation at the price of £1,930 per car. The report was passed by the Council.

Tramcar Motors for Hull. The tramway electrical engineer has reported to the Hull Tramway Committee that he had obtained quotations for the supply of 30 tramcar motors, to replace those which had become obsolete in cars which had been running since the inauguration of the tramways undertaking. Owing to the state of the market and the combination of electrical firms engaged on the manufacture of tramway and railway motors, some delay had been experienced in obtaining prices, and it was found that the motors offered were the standard type of the makers who quoted, but in certain mechanical details were a departure from their present standards. With a view of standardisation of certain renewal parts, etc., which would effect a considerable saving in the maintenance of the equipments, the engineer is at present in negotiation with the makers, and to prevent further delay he recommended that the matter be left in the hands of the Chairman of the Stores and Workshops Sub-Committee, the Chairman and Deputy-Chairman of the full Committee, and himself, with authority to purchase directly a settlement had been arrived at. The recommendation was adopted.

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DICK, KERR & CO., LTD.
PHŒNIX DYNAMO MANUFACTURING CO., LTD.
UNITED ELECTRIC CAR CO., LTD.
WILLANS & ROBINSON, LTD.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1918.	Incr. or Dec.
Aberdare U.D.C.	Apr. 22	460	769	+ 309	3	1,880	—
Aberdeen Corporation	May 31	3,395	4,849	+ 1,454	52	139,512	+ 24,455
Ayr Corporation	June 7	611	717	+ 106	3	2,009	+ 631
Belfast City	„ 30	7,732	11,350	+ 3,618	9	91,103	+ 22,036
Birkenhead Corporation	„ 8	2,163	2,885	+ 722	9½	25,376	+ 4,254
Birmingham Corporation	May 31	23,744	26,034	+ 2,290	9	230,04	+ 27,731
do. Motor Buses	„ 31	1,572	1,831	+ 259	9	15,060	+ 1,786
Blackburn „	June 4	1,981	2,483	+ 502	10	24,026	+ 5,164
Bradford Corporation	„ 31	8,483	11,365	+ 2,882	9	99,116	+ 27,709
Burnley Corporation	„ 7	2,128	3,069	+ 871	..	..	
Burton-on-Trent Cor.	„ 8	391	501	+ 110	10	4,627	+ 717
Bury Corporation	„ 8	2,029	2,392	+ 363	9½	24,071	+ 3,939
Chatham & District	May 29	1,321	1,631	+ 310	21	28,624	+ 2,764
Cork Electric	„ 29	737	782	+ 45	21	12,346	— 512
Derby Corporation	June 7	1,515	2,159	+ 644	10	17,970	+ 3,146
Dundee City	„ 9	2,009	2,438	+ 438	2½	6,784	+ 1,077
East Ham Corporation	„ 7	1,557	2,019	+ 462	9½	18,778	+ 5,076
Glasgow Corporation	„ 7	31,255	33,912	+ 2,657	1	33,912	+ 2,657
Glossop (U.E. Sup. Co.)	„ 7	194	231	+ 37	23	5,079	+ 858
Halifax Corporation	„ 3	2,933	3,768	+ 835	9½	32,258	+ 6,303
do. Motor Buses	„ 3	63	80	+ 17	9½	717	+ 146
Huddersfield Corporation	„ 7	3,834	4,898	+ 1,064	10	47,737	+ 9,971
Ilford U.D. Council	„ 31	998	1,247	+ 276	9	10,684	+ 2,233
Ipswich Corporation	„ 7	758	1,067	+ 309	10	8,334	+ 1,251
Isle of Thanet	„ 4	285	554	+ 269	3½	15,911	+ 9,098
Kilmarnock Corporation	„ 7	232	271	+ 39	3¾	1,004	+ 176
Lanarkshire	May 29	3,710	4,204	+ 494	21	67,020	— 4,371
Leeds City	„ 31	12,415	17,240	+ 4,825	9	145,000	+ 42,000
Leicester Corporation	June 7	4,743	6,210	+ 1,467	..	..	
Leyton U.D. Council	„ 5	2,297	3,342	+ 1,045	10	30,665	+ 10,110
Liverpool Corporation	„ 7	19,444	23,733	+ 4,289	22½	480,684	+ 84,755
Llandudno & Colwyn Bay	„ 16	367	523	+ 156	24	8,556	+ 1,878
London County Council	„ 11	65,304	92,615	+ 27,311	10½	833,409	+ 208,331
Maidstone Corporation	„ 5	287	376	+ 89	9½	3,604	+ 853
Manchester Corporation	„ 7	26,581	31,099	+ 4,518	10	300,104	+ 55,653
Newcastle-on-Tyne Cor.	„ 7	9,440	9,470	+ 30	10	91,803	+ 1,326
Northampton Cor.	„ 6	834	1,320	+ 486	10	12,193	+ 3,391
Nottingham Corporation	„ 5	6,081	7,230	+ 1,149	10	67,571	+ 12,379
Oldham Corporation	„ 8	3,419	4,755	+ 1,336	11	47,147	+ 8,982
Reading Corporation	May 29	1,302	1,634	+ 332	8½	13,032	—
Rotherham Corporation	June 4	2,111	2,261	+ 150	9½	21,358	+ 1,655
Sheffield Corporation	„ 8	13,589	17,040	+ 3,451	10½	181,577	+ 36,608
Southampton Cor.	„ 4	2,582	2,821	+ 239	9¾	25,244	+ 1,638
Southend-on-Sea Cor.	„ 21	1,604	1,828	+ 220	8	12,453	+ 5,865
South Shields Cor.	„ 21	1,116	1,421	+ 305	7	9,409	+ 2,298
Sunderland Corporation	„ 8	2,030	3,047	+ 1,017	10	28,410	+ 7,380
Swindon Corporation	„ 14	280	335	+ 55	6½	2,031	+ 160
Torquay Tramways	May 29	894	1,139	+ 245	21	18,323	+ 2,350
Tyneside Trys. & Trmrds	„ 28	1,119	1,220	+ 101	22	19,753	— 276
Wallasey Corporation	June 7	2,005	2,583	+ 578	9½	24,314	+ 6,553
Walsall Corporation	May 31	1,154	1,369	+ 215	9	12,468	+ 1,483
Walthamstow U.D. Coun.	June 7	1,702	1,896	+ 194	10	17,689	+ 3,315
Warrington Corporation	„ 6	742	904	+ 162	9	8,465	+ 1,426
West Ham Corporation	„ 5	4,528	5,895	+ 1,367	9¾	52,329	+ 12,222
Wolverhampton	„ 11	1,670	2,981	+ 1,311	10	21,291	+ 3,300

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District Tramways (M.E.T.) Omnibus Co., Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	June 3	£55,495	£21,250	22	£1,252,291	+ £34,367
Auckland (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,332
Ballarat and Bendigo (4 wks)	Mar. 30	3,885	3,623	52	45,754	+ 1,182
Brazilian Traction (Mrs.)	Apr.	8,330,000	9,208,000	17	35,032,000	+ 3,456,000
Brisbane	Apr.	35,530	38,775	17	151,110	+ 13,541
British Columbia $	Apr.	515,417	631,588	43	6,022,107	+ 1,011,419
Buenos Aires Lacroze	May	41,315	47,317	48	481,503	+ 52,123
Burmah Tram. & Light Rs.	Apr. 30	27,614	36,815	39	325,985	+ 86,230
Calcutta Rs.	May 24	71,308	83,720	20½	1,746,109	+ 241,597
Cape Town	Apr.	19,011	22,564	..	..	..
Carthagena and Herrerias	May	5,027	3,226	21	13,418	— 9,167
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,402
East India	May	1,920	2,131	43	19,679	+ 5,472
Hong Kong $	Apr. 19	14,090	13,693	16	225,344	+ 8,706
Kalgoorlie	Jan.	2,522	2,562	4	2,562	+ 40
La Plata	May	5,165	5,702	22	29,852	+ 4,274
Lima	Mar.	42,076	50,716	13	142,160	+ 104,602
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	May 31	41,152	45,575	21	361,068	— 39,811
Manaos Rs.	Aug.	150,657	182,507	34	1,152,686	+ 53,959
Manila $	Mar.	172,750	207,792	13	650,745	+ 142,995
Montevideo	May	32,301	27,382	31	265,287	+ 26,949
Para	Apr.	24,745	25,342	21	122,927	+ 3,761
Pernambuco	June 1	4,082	5,605	21½	118,193	+ 18,420
Peruvian $	Feb.	925,410	943,470	34	7,973,835	— 229,195
Port Elizabeth	Apr.	4,028	5,576	...	...	...
Rangoon	Apr.	5,885	6,217	17	25,817	+ 2,954
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore $	Apr. 26	12,858	14,013	17	267,992	+ 38,837
Toronto $	Apr.	1,065,766	1,051,960	17	4,257,882	+ 28,392
Winnipeg $	Mar.	307,289	384,937	13	1,146,638	+ 205,808

WANTED.

COPIES OF "THE TRAMWAY AND RAILWAY WORLD."

Issues of January 1 and 13, 1910, and August 16 and October 18, 1917, to complete files for binding.

Indexes to Vols. XI (Jan. to June, 1902), XIII (Jan. to June, 1903), and XXXVIII (Jan. to June, 1915).

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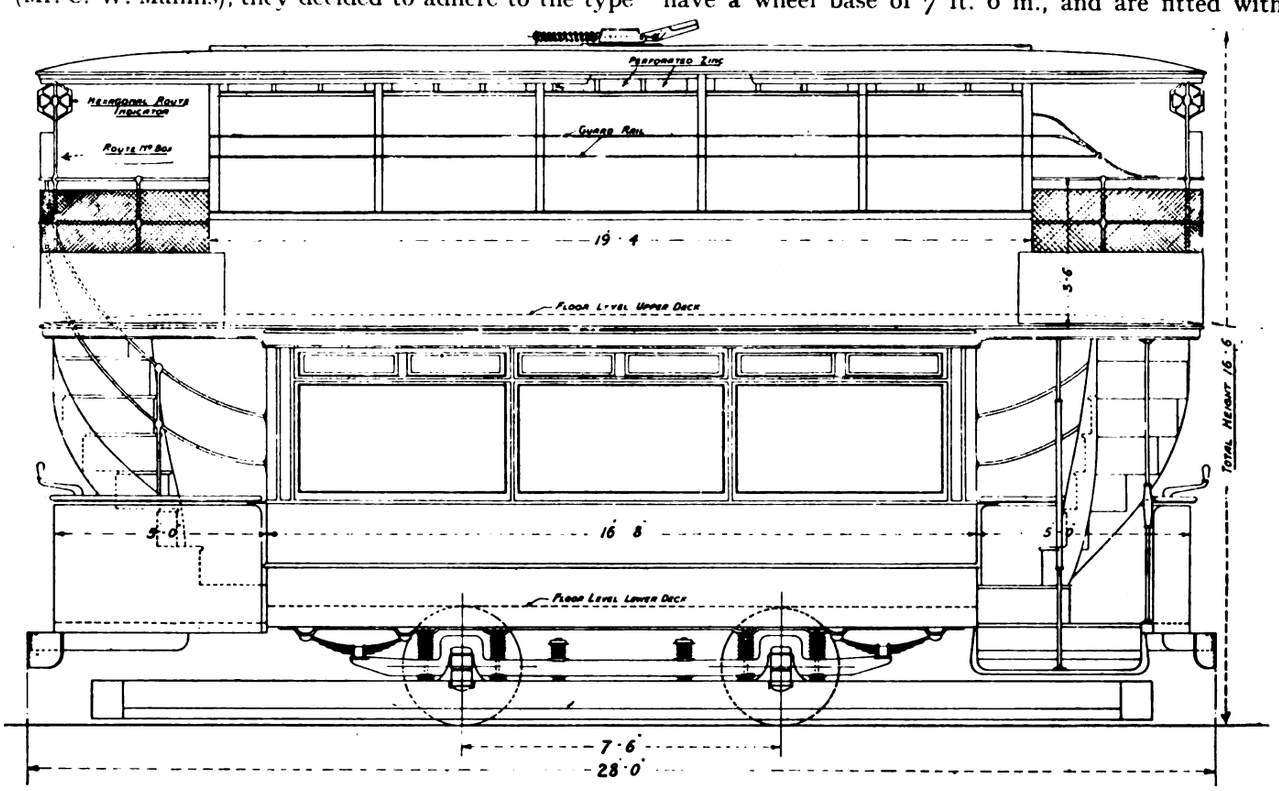
THE Tramway & Railway World
WITH MOTOR TRAFFIC SECTION

Founded 1892. LONDON, JUNE 19, 1919. VOL. XLV.

NEW CARS FOR LIVERPOOL CORPORATION TRAMWAYS.

Among the first Corporations to place orders for new tramway cars after the armistice was Liverpool. The congestion of traffic in that city had rendered necessary a considerable addition to the rolling stock, and the Tramways and Electric Power and Lighting Committee, with notable enterprise, lost no time in deciding upon the type of car and in placing orders. On the recommendation of their general manager (Mr. C. W. Mallins), they decided to adhere to the type of car which was standardised at Liverpool many years ago. The single-truck car, with reversed stairway and canopy top, has been found to be well adapted to the requirements at Liverpool, and although the Corporation has made use of a number of other types, which have been well tested in operation, the general manager had no hesitation in adhering to the standard type.

Tenders were received on February 3, and in due course an order for 25 completely equipped electric cars was placed with The English Electric Company, and the first of these cars are about to be delivered. As will be seen from the accompanying drawings, the cars are of the single-truck, double-deck, reversed staircase type. The new cars will provide seats for 64 passengers, 22 on the lower and 42 on the upper deck. The seats on the lower deck are longitudinal, while on the upper deck there are cross seats with reversible backs, arranged as shown on the plan. The cars are mounted on trucks of the Brill type, with forged side frames 12 in. deep on the axle box, $4\frac{1}{4}$ in. in the centre, and 4 in. outside of the axle box. They have a wheel base of 7 ft. 6 in., and are fitted with wide wing Brill type cast-steel boxes. The axles are Siemens-Martin forged steel, capable of bearing a tensile strain from 32 to 37 tons per square inch. The wheels are $33\frac{1}{2}$ inches outside diameter, and are fitted with $27\frac{1}{2}$ in. steel centres and 3 in. steel tires of British standard specification.



Elevation of Standard Liverpool Corporation Car—Twenty-five Cars of this Type have recently been Ordered.

The electrical equipment consists of two 40 H.P. Dick, Kerr motors and controllers. The latter are of the solenoid blow-out series-parallel type. Each car is wired for five circuits of five lights each, fitted with standard metallic filament lamps. An electric bell and push are placed at each end of the car, with six pushes inside the car, three being placed on each side.

In the underframe of the car body the sole bars are

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of English oak, and all members run the full length of the body. The platforms project from the main framing, and the two outside bearers are plated their whole length with quarter-inch steel plates well secured. The platforms are 5 ft. in length, and are floored with pine boards, as are the floors of the car. Trap-doors are arranged as usual in the floor to give access to the motors. The whole of the pillars and rails of the body framing are of English oak, and the corner pillars are strengthened with wrought-iron angle pieces. All external panels and mouldings are of bay wood. Roof ribs are of English ash, strengthened by ⅜ in. steel car lines in every roof stick. The interior of the car is finished with quartered English oak in the natural grain of the wood. The side windows of the lower deck are fixed, and consist of 5-16 in. polished plate-glass, bedded with grooved rubber strip and secured by wood beading. The seats on the lower deck are divided into three lengths, and are fitted with rattan seats and backs.

The trolley bases are of the Brecknell, Munro and Rogers type, with ball bearings, and the trolley head is of the new anti-fouling type designed by Mr. C. W. Mallins.

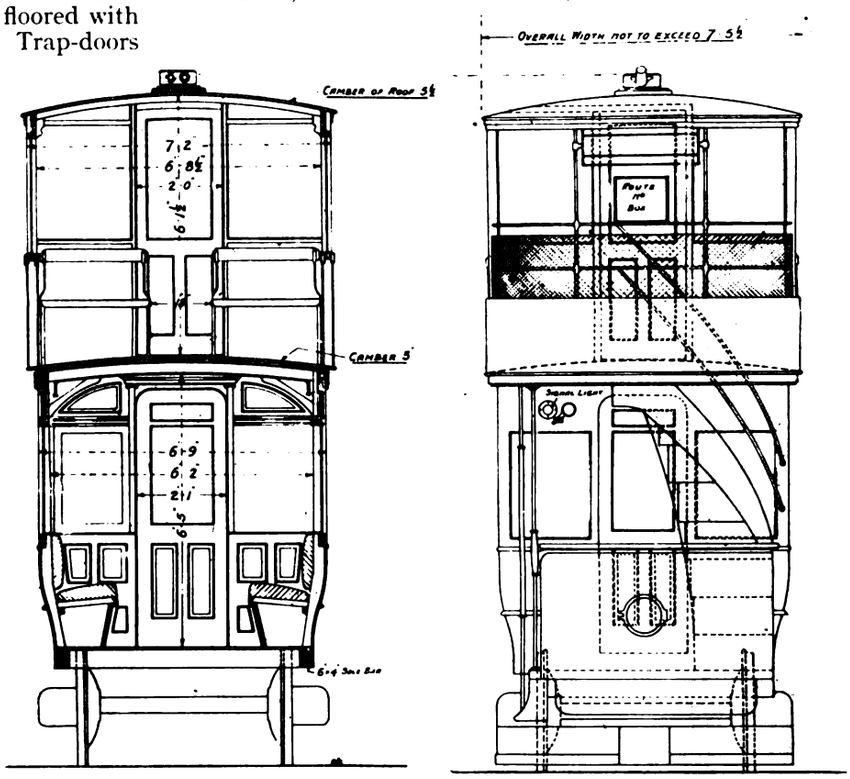
The following table gives the leading dimensions of the car :—

Length over buffers	28 ft. 0 in.
Length of each platform... ...	5 ft. 0 in.
Length of body (inside lower deck)	16 ft. 0 in.
Length of body (inside upper deck)	18 ft. 11 in.
Width over all	7 ft. 5½ in.
Wheel base	7 ft. 6 in.
Clear height inside at centre of lower deck ...	6 ft. 5 in.
Clear height of upper saloon at centre ...	6 ft. 1½ in.
Height over trolley base	16 ft. 6 in.
Height of end door openings, lower saloon ...	6 ft. 0 in.
Height of end door opening, top saloon	5 ft. 9 in.
Height from rail to under side of trolley base ..	16 ft. 0 in.
Height of floor above rail	2 ft. 8 in.
Weight when equipped, but empty, about	10 tons 12 cwt.

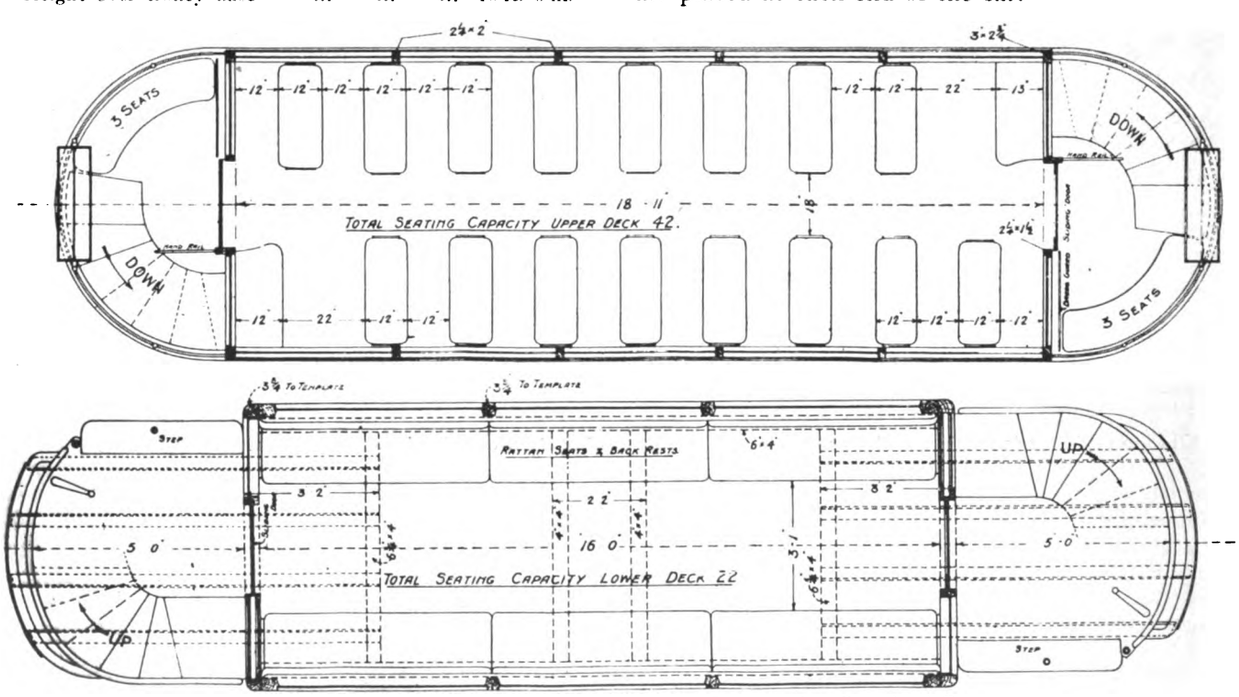
No drawbar is fitted to these cars, but a chain is kept on each car for towing, if disabled.

Lifeguards of the Liverpool type, entirely enclosing the wheels, are fitted to the truck, and there are four pedal sand boxes, also of the standard Liverpool type.

Destination indicators are fitted at each end of the car, as shown on the drawings. Route number boxes are placed at each end of the car.



Section. End Elevation.



Plan of Upper and Lower Decks—Liverpool Corporation Standard Car.

For the foregoing particulars and the accompanying drawings we are indebted to the courtesy of Mr. C. W. Mallins, general manager of the Liverpool Corporation Tramways.

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TOWN-PLANNING AND TRAMWAYS.

A Scheme Providing a Notable Improvement in Transport Facilities.

Mr. James Thomson, city engineer of Dundee, recently presented to the Housing and Town Planning Committee of the Town Council comprehensive improvement schemes to be carried out over a long period of years. The schemes are embodied in an interesting report which included ten large scale maps showing clearly the work done, together with an aircraft view of Dundee and neighbourhood, showing areas to be reclaimed and the route through the district of the proposed national East Coast highway. Mr. Thomson urges the Council to keep the subjoined proposals fully and clearly in view :—

(*a*) That if the expansion of the city and district is to go forward advantageously, economically, and scientifically, and if the interests of future citizens are to be fully conserved, the preparation of a plan of development is necessary ;

(*b*) That such a plan to be sufficiently comprehensive must include schemes designed for execution many years hence and beyond present day requirements ; and

(*c*) That the plan is overdue, and its preparation has become urgent.

Under former conditions, traffic streets were made unduly narrow and residential streets unnecessarily wide, and gradients were fixed excessively steep and without regard to the contours of the land. Under the conditions now proposed, this could not possibly recur. Assuming consistent adherence to a comprehensive plan, great advantages would be obtained. Streets would be designed ahead of actual requirements, while the widenings of main traffic roads could be carried out as opportunities permitted and as parts of a feasible scheme of new main traffic roads. Such a plan would ensure the necessities of traffic being provided for in a systematic design of roads, tramways, and railways and their connections, so that expedition and economy in transport would result.

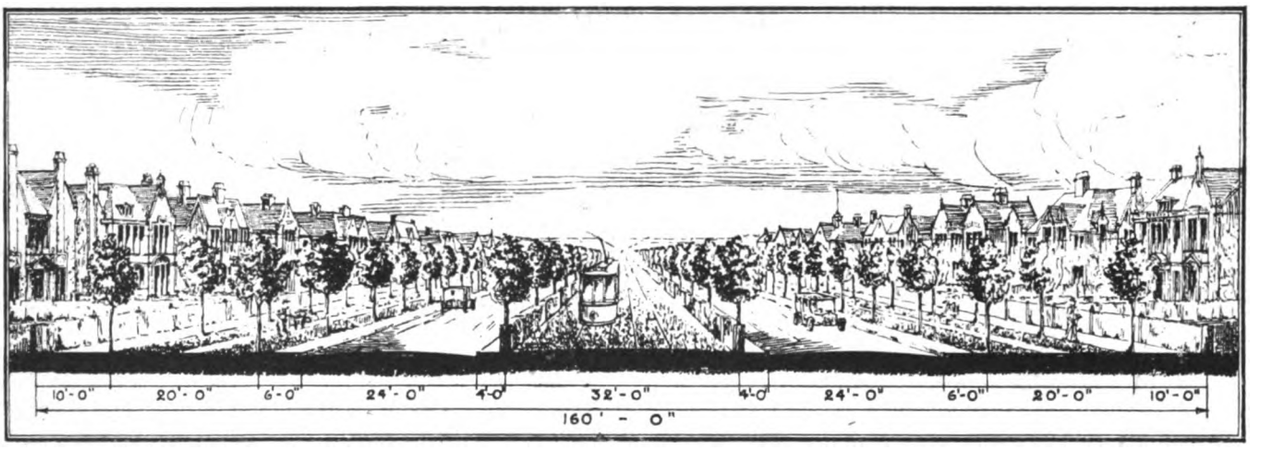
Parkways and Tramways.

Mr. Thomson's scheme is divided into the following sections :—

(1) Removal of congestion ; (2) central main streets ; (3) existing and proposed main arterial roads and the land beyond the city boundaries ; (4) outer ring road and the parkways ; (5) river front and the roadway over the Tay ; (6) parks and open spaces ; (7) transit ; (8) present and future housing and industrial areas ; (9) comprehensive plan of development ; and (10) proposals which should be considered (*a*) now, and (*b*) later.

Ideal conditions in expansion are impossible of attainment, but in the preparation of a plan of development the aim should be to achieve as nearly ideal conditions as existing obstacles will permit. It is proposed that a ring road should be formed mainly through undeveloped land, and that certain existing roads should be made parkways for the purpose of forming a connected system of public parks. While these would be beautified with trees and grass borders, their utility as public thoroughfares would not be disturbed. It is suggested that all land required for the ring road or for the parkways should be given free of charge by the owners, because the land through which these thoroughfares pass is certain to be greatly enhanced in value for building purposes. In addition, the owners of property would repay to the Council a large proportion of the cost of forming these roads opposite their properties, in view of the exceptional attractiveness of their frontages ; the tramways account would bear the cost of the construction of the tramway track, and in these ways the expense to the ratepayers would be reduced.

The ring road would connect at both ends with the river front, and extend along the east, north, and west undeveloped parts within and beyond the city, forming junctions with important roads. The length of this ring road would be seven miles, and its width 160 ft., comprising a central tramway track laid in the grass, two carriageways, one each side of the tramway, and two ample footways, and having also six rows of trees, two along the tramway and two on each of the footways. Only a portion of the length and width of the road would at the outset be opened up. When completed, with its provision of two carriageways for traffic travelling in opposite directions, its separate track for swift tramway service, its easy gradients, and its junction with main arterial roads, it should become one of the most useful and attractive of traffic and pleasure thoroughfares, opening up building land with exceptional frontages for residences.



Park Ways as Proposed at Dundee—Tramways on Special Track Free from Obstruction.

The parkways as far as possible follow the lines of existing roads, and form links with the parks, so as to continue to serve as traffic roads. Like the ring road, they would be tree-planted and provided with grass verges.

If full advantage is to be taken of the undeveloped land on the outskirts, and the urban and rural areas blended in a comprehensive plan of development, it is of the first importance that cheap and rapid transit facilities should be provided. Without these facilities in the form of either tramways or motor omnibuses, and without collaboration between the housing and tramway departments, successful schemes of expansion will be impossible.

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NEED FOR FURTHER TRANSIT FACILITIES.

The Dundee tramway system is in the form roughly of seven lines radiating from High Street to seven termini near the outskirts. It may be diagrammatically represented as a fan with seven radial lines to the outlying districts showing how these districts may be conveniently connected up by tramways on the proposed outer ring road.

Each of the seven radial lines commences in and passes through an industrial area, and each passes into and terminates in a residential area. Stated generally, these lines terminate at or near undeveloped land; and it is at this point the necessity presents itself for the inclusion in the comprehensive plan of city development of a well-considered scheme making provision for transit facilities for all the outskirts, which can be put into execution in parts as the necessities of districts demand. Such a scheme, designed, as it should be, in conjunction with and as part of the plan of development, would have great influence on the economic expansion of the city.

The question of whether transit facilities should take the form of tramways or motor omnibuses is one which need not be settled now, but whatever form these may take the development plan should provide ample width on arterial roads and on the outer ring road for the construction of tramways on a separate and special track in grass without concrete foundation or paved surface, the rails being laid on sleepers in ballast.

The advantages of such a method of construction are many. The roads would be beautified and would partake in the outskirts of the nature of avenues; the cost of track construction would be largely reduced; the expense of upkeep would be considerably less; there would be much saving in wear and tear of rolling stock; the cars would run more smoothly; there would be less noise and dust, and there would be no obstruction by ordinary traffic.

Rapid transit is impossible on the city tramways under existing conditions, but given the method of construction and conditions above described, a speed of thirty miles an hour could be attained with stopping places on extended tramways in and beyond the outskirts. On this point the following quotation from the report of the Royal Commission on Housing in Scotland is apt, and applicable to more places than Dundee:—

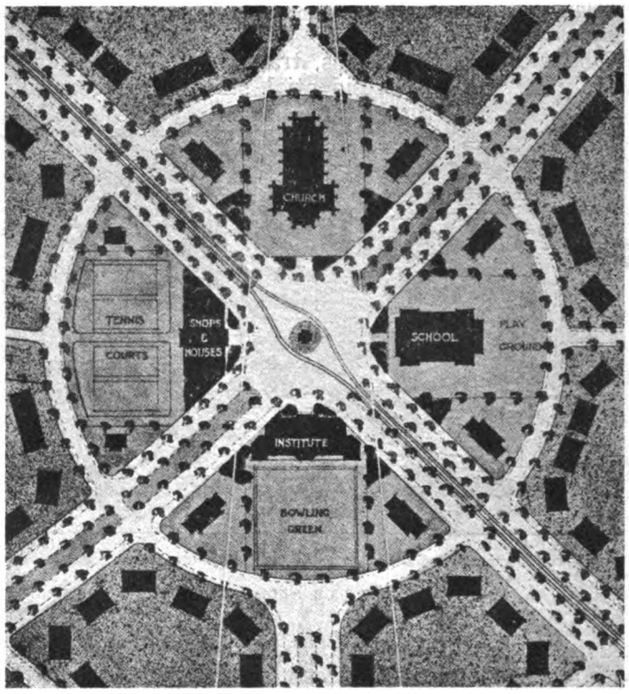
"We are much impressed with the necessity for the construction of main roads out of cities and populous places in such a manner that new cheap land may be opened up for building purposes. This principle of opening up new land and spreading the population involves the necessity of providing cheap and rapid transit. At the present time the average speed of tramways in the centre of a city is extremely slow. The speed increases more or less proportionally to the distance from the centre; but even in the suburbs a speed of twelve miles is usually the prescribed maximum. Such restrictions are, no doubt, quite right in the interests of public safety in the present order of things, and we have become accustomed to accept such average speed as sufficient, or perhaps as the best obtainable. It is, however, altogether insufficient, and we consider that the housing requirements are such that special tracks should be provided upon sufficiently wide roads, so that the maximum speed along these exclusive tracks should reach a maximum of thirty miles per hour."

If cheap fares are combined with swift travelling cars, substantial service will have been rendered by the tramways department in solving the housing difficulty. People will be encouraged to make their homes beyond congested areas, and the travel habit will continue to increase. The travel habit has increased tremendously owing to the introduction of electric traction, and with the further facility of high-speed tramway cars the population will be spread over much of the land at present undeveloped.

THE IDEAL OF THE TRANSPORT ENGINEER.

Cheap and rapid transit facilities will do more. They will encourage the opening of new works areas in the districts designed to be placed beyond the outer ring road.

Mr. Thomson's printed report contains a series of maps, shown in colour, each designed to bring out particular aspects of the present condition of Dundee, and the improvements adumbrated in the scheme. Map No. 1 shows, by graded shading, the degrees of congestion in the city. On Map No. 2 the railway facilities are illustrated. Map No. 3 gives the proposed ring road, with added arterial roads, and the presently existing thoroughfares. Proposed open spaces, parks, and park roads are indicated on Map No. 4. A scheme of land reclamation on the river front is the main feature of



Example of Town Planning with Tramways.

Map No. 5, the traffic routes made possible by the scheme being included. Map No. 6 flourishes before the eye the greenery to be introduced into the grey spaces of Dundee.

On Map No. 7 the city engineer shows the existing lines of tramways, the tramway extensions on the main roads, and the ring road which may be carried out by instalments, serving the land which it is suggested should be laid out for industrial undertakings, housing, parks, open spaces, and main thoroughfares, and which should be provided with transit facilities. This land cannot be successfully developed, nor appropriately allocated for works areas and housing without, at the very outset, providing a comprehensive plan of tramway extensions which can be adhered to as part of the general plan of tramway extensions for the expansion of the city. And it may be confidently assumed that apart entirely from the many recognised transit advantages of good tramway service, there will be the further benefits of the possibility of adding to the

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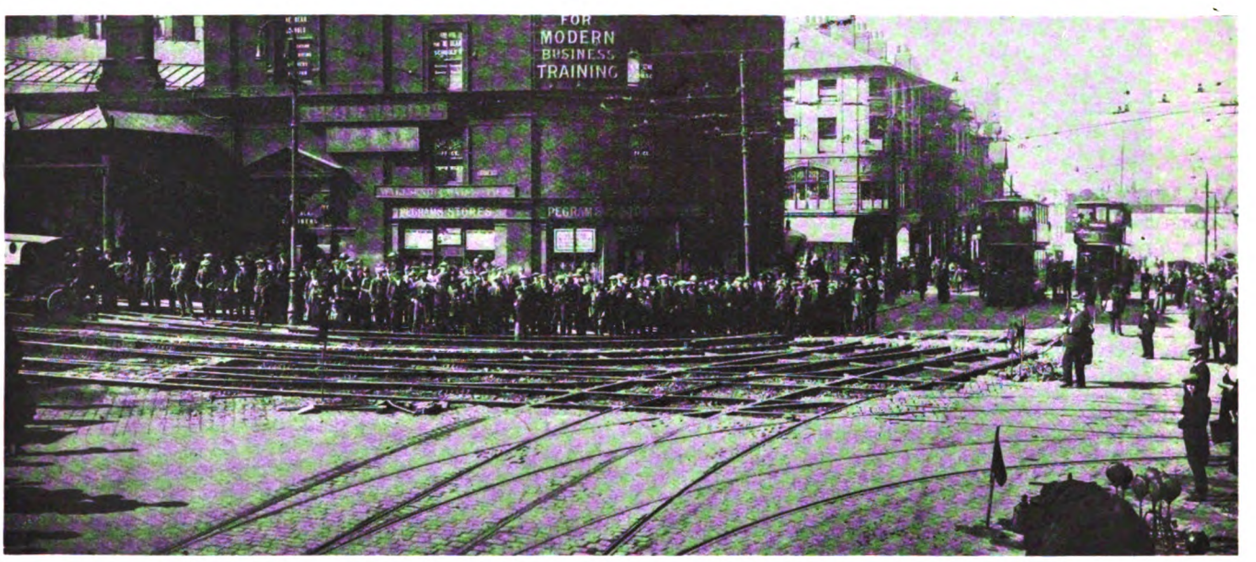
population without increasing the density, of the placing of public works and industrial undertakings on healthy sites, of a substantial contribution to abolition of slums, of encouragement to citizens to get to the open country, and of the consequent improvement of public health.

The whole scheme of development it is proposed should in the meantime be spread over fifty years. Within that period many changes must be effected and improvements carried out, but it is hoped that in the immediate future substantial forward movement will be made.

Prepared from the standpoint of civic amenity, this Dundee improvement scheme is an impartial testimony to the essential part which tramways must play in the future development of town planning. Without tramways, or other means of rapid transit, all such schemes are wholly impracticable. The fundamental principle is extension of area, which involves increased need for transit and that at greater speed. Cost of transport is the economic cause of town congestion, and to be economically sound any town planning scheme must include the means of transport which shall reduce the cost of extended travel to the lowest minimum. Other factors enter, of course, but the ideal of the transport engineer is to make his undertaking an economical acquisition to the community which it serves.



Relaying Fitzalan Junction—Sheffield Corporation Tramways.

FITZALAN SQUARE JUNCTION, SHEFFIELD CORPORATION TRAMWAYS.

One of the most striking examples of the remarkable wear resisting properties of Hadfield's managanese steel is afforded by an important layout in connection with the extensive system of the Sheffield Corporation Tramways. This is situated in Fitzalan Square, the centre of the city, from which the tracks radiate in all directions. The system is so arranged to provide a through service of cars, and owing to the location of this special layout, practically the whole of the cars pass over it.

The information we give below is of special interest, as it shows how economy in upkeep can be effected and how to minimise the delay caused by dislocation of traffic during reconstruction, this being a most important consideration in all industrial centres. It is quite obvious that the frequent replacing of rails at this important part of the city was out of the question, in fact impracticable—that is to say, the roads could not be closed to traffic.

In the early days of electric traction in the city, this junction was constructed throughout with rails, points, and crossings of ordinary steel, but owing to the superelevation of the layout the amount of wear was so abnormal that the rolled carbon steel rails and other parts had to be renewed every few weeks, whereas after several years' service the amount of wear on the "Era" manganese steel construction, made by Messrs. Hadfield's Limited, Sheffield, was scarcely appreciable. Thus it is quite correct to say that without this special material the through service could not have been maintained except with the greatest difficulty and abnormal expense.

The first junction layout in Hadfield's Patent "Era" manganese steel supplied for Fitzalan Square was in 1901. Its condition was carefully recorded up to the date of renewal in September, 1907, when it was replaced, not because it was worn out, as it was admittedly fit for several years further service, but had to be removed to meet the demands of the greatly increased car service and the necessity to re-design the junction so as to provide for additional tracks. The second "Era" manganese steel layout was laid in September, 1907, and has recently been relaid without interference with the car service or general traffic under the supervision of Mr. W. J. Hadfield, Sheffield City Engineer.

The following data respecting the two layouts demonstrate the supreme wearing qualities of this material :—

	First Layout Laid Sept., 1901 Replaced Sept., 1907	Second Layout Laid Sept., 1907 Replaced May, 1919
Average number of cars per day	2,700	3,510
Tonnage per day	27,000	30,000
Maximum vertical tread wear per 10,000	·0021 in.	·0028 in.
Total vertical tread wear in six years	·484 in.	·781 in.
Total number of cars that passed over the junction	5,225,000	13,500,000
Number of points	8	16
Number of crossings	18	28
Number of intersections	28	40
Number of rails	47	59
Number of years' wear	6	12
Total weight of layout	20 tons	33 tons

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TRAMWAY CAR ELECTRIC LIGHTING.

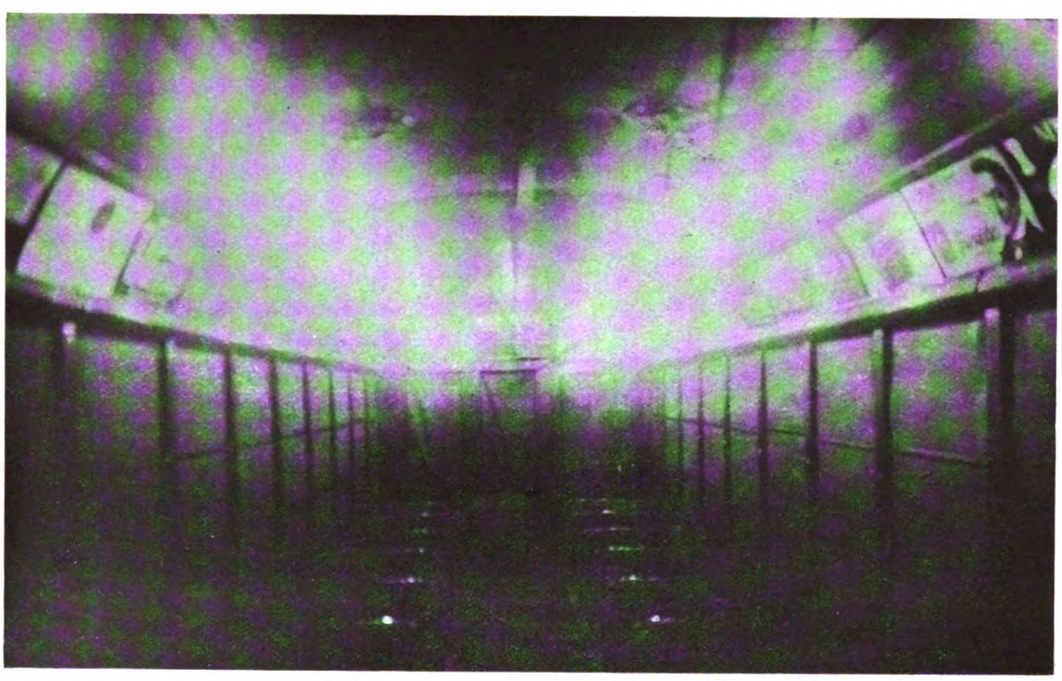
Air raiders have long ceased to threaten life and property with bombs from the sky, lighting restrictions have been removed, and the numerous brood of orders and regulations apparently designed to convert law-abiding citizens into criminals have vanished into the limbo of useless things. Now that the period of darkness is past, the opportunity of the illuminating engineer has come. Before the war the lighting of tramcars was far from perfect, though the carbon filament lights distributed along the sides of the car marked an advance on smoky lamps fixed in dim recesses at each end, making darkness visible.

Improvement in the lighting of tramway cars is desirable, expected, and highly possible. A leading tramway engineer recently said that the light wiring on most cars had been worn out, and was constantly liable to breakdown. There is all the more reason therefore for a new start being made in that direction. The unshaded carbon filament lamps at present largely in use can hardly be accounted the last word in tramcar lighting. On the contrary, the method is quite out of date, and metallic filament lamps have established themselves in the lighting field. Anyone looking into a car lighted with unshaded lamps can see that the light is almost wholly concentrated in a strong glare near the roof of the car, the rest of the interior being in shadow. Accompanying is the reproduction of a photograph of a car interior lighted with the carbon filament lamp. Only by careful scrutiny is it possible to discern the seats of the passengers, and it needs no great exercise of imagination to understand the discomfort which such a mode of lighting inflicts on the car-users. There is plenty of light, but it is not properly distributed, and that is the whole trouble.

It is unnecessary to argue that the metallic filament electric lamp is superior to the carbon filament type, but demonstration of the admitted fact may not be wholly superfluous. On the opposite page two illustrations show a system of electric car lighting employed at Toledo, Ohio, by the Toledo Railways and Light Company. The car shown in photographs reproduced is equipped with tungsten lights and suitable reflectors. As may be seen, the new method sheds a beautiful glow of diffused light throughout the whole compartment, effectively illuminating every detail. Even the floor is visible, and the seats stand out with clear distinctness. Glare is absent, and there is sufficient light for comfortable reading.

All three pictures were taken under precisely the same conditions—on a dark night, with the curtains of the cars closely drawn, so that the only light seen is that coming from the lamps. It is also affirmed that, while giving three times the illumination of the old method, the new system uses only about one-third of the current required when carbon filament lamps are employed.

The Toledo cars have an inviting interior, seen under the diffused light of the tungsten lamps, and there is one detail which is rather notable. Depending from the strap rail there are substantial straps with handgrips made of porcelain. Not only do these handgrips afford the passenger a solid hold, but they are also easily cleaned, and do not absorb the sweat and dirt from the hands of those who use them.



Old Style Tramway Car Lighting—Unshaded Carbon Filament Lamps.

MELBOURNE RAILWAYS ELECTRIFICATION.

On May 28 electric service on the Sandringham-Essendon section of the Melbourne Suburban Railways was publicly inaugurated by the Hon. W. A. Watt, Acting Prime Minister of the Commonwealth, the Prime Minister of Victoria, and the Minister of Railways. From a cablegram received from Melbourne it appears that everything worked with perfect smoothness, and that the popularity of the electric service is assured. This first section is 20 miles in length, but the whole system of railways being electrified includes some 150 route lines.

It will be remembered that German manufacturers made a great effort to have the single-phase system adopted, but when it came to a comparison based upon actual tenders, the 1,500-volt direct current system which was ultimately chosen proved much the cheaper both in first cost and in operation. The work began in 1913, and has been carried out for the Victoria Railways Commissioners under the supervision of Messrs. Merz and McLellan, consulting engineers, Westminster.

The principal contractors were :—Babcock and Wilcox, Limited, C. A. Parsons and Company, the Weymouth Proprietary, Limited (Melbourne), the General Electric Company (New York), the British Insulated and Helsby Cables, Limited, and Siemens Brothers' Dynamo Works, Limited.

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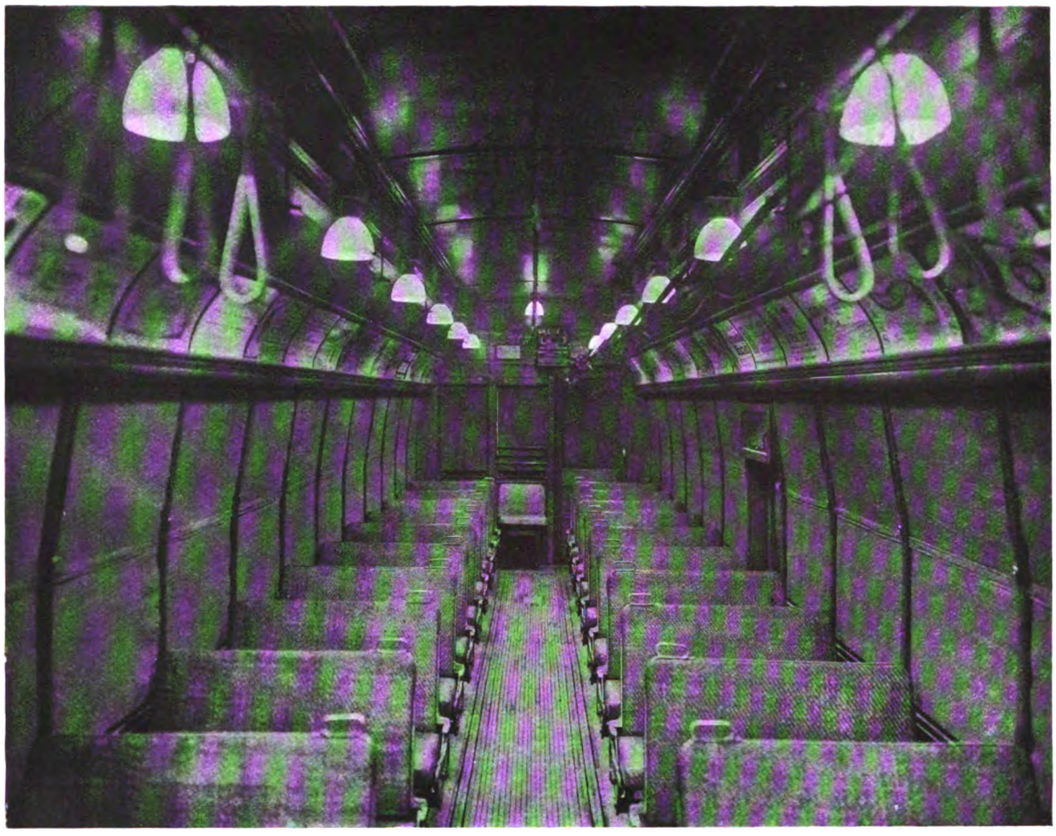

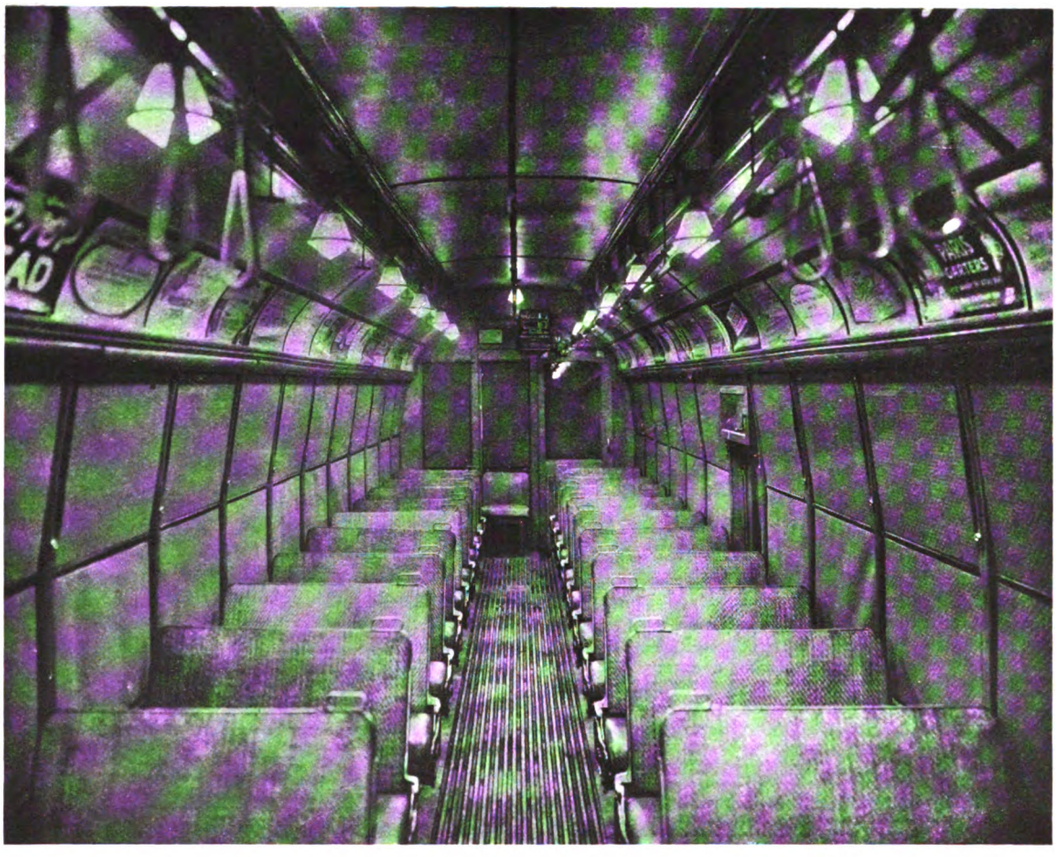

Modern Tramway Car Lighting—Metallic Filament Lamps Correctly Shaded.
[Note also the Sanitary Porcelain Hand Grips.]

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THE SANDBERG "IN SITU" RAIL HARDENING PROCESS.

By Robt. B. Holt, M.I.Mech.E.

A full description of the Sandberg system of sorbitically treating existing tramway rails appeared in The Tramway and Railway World of April 11, 1918. Since that date, however, extensive contracts have been entered into with the following tramways:—Croydon, Metropolitan (London), Manchester, Birmingham, Bournemouth, Liverpool and Glasgow, both for the treatment of entire lengths of track, curves subjected to excessive wear, and rail joints. Repeat orders have been obtained from Croydon, Metropolitan (London), Manchester, and Birmingham. The development of the commercial side of the patent by Messrs. Scholey & Co. Ltd., 56, Victoria Street, London, S.W., the licensees, has only been limited by the scarcity of labour, plant, and materials; the number of inquiries received indicates clearly the urgent need for a means whereby the life of existing tramway rails can be prolonged.

In the former article mention was made of the initial experiments carried out on the Leeds Corporation Tramways with this process. The experiments in question were of a drastic nature, and lengths of treated rail were subjected to, and withstood, very severe physical tests before the treatment was applied to rails in the track. The laboratory tests included:—

(1) A fifty-ton pressure test on a 19-mm. steel ball placed in the centre of the rail tread, without producing any appreciable indentation; it is interesting to note that in two instances the hardened steel balls themselves fractured under the load.

(2) The standard Brinell test, which indicated that the hardness of the treated surface was almost double that of the metal half an inch below the surface.

(3) Etching and microscopic examination at high magnification which disclosed the important fact that there was no sudden line of cleavage between the under side of the treated metal and the body of the rail tread, but that the change was gradual through the usual ranges of molecular disposition.

(3) Rails were subjected to continuous power hammer tests at frequent intervals throughout their length; the weight of the blow being one hundredweight, and as many as two hundred blows being applied to one spot with the object of detaching the treated surface. This test, and similar tests with the same object, failed to break away any portion of the hardened rail face, and moreover the indentations on the rail were of a negligible character.

(5) Specially hardened cold chisels, when applied to the treated metal with a three-pound hammer, either turned up at the edge or the edges broke away without producing more than superficial scratches.

In consequence of the satisfactory nature of the laboratory tests, short lengths of rail were treated in the track, and careful gaugings from previously prepared "datums" to the nearest half millimetre, before and after treatment, indicated that the process was in no way liable to set up expansion stresses. Following upon a series of minor applications of the process, several hundred yards of track were treated in different positions on the track, and the position to-day, after two years in service, and, in one case, after the passage of close upon a quarter of a million cars, is that the wear on the treated rails is so slight as to defy practical measurement, whilst the adjoining untreated length of the same rail shows $\frac{1}{16}$ in. more wear. The advantages of the "*in situ*" process are plainly manifest, and their value cannot be overestimated. One interesting experiment carried out exactly two and a quarter years ago in Leeds indicates that after the passage of 360,000 cars the rails treated by this process, whilst subjected to precisely the same influences which cause adjoining lengths of the same rail to corrugate, remain unaffected. Evidence that the treated rails are subjected to the same influences which cause the untreated rails to corrugate is apparent, under certain climatic conditions, in the formation of corrugations in the greasy mud film covering the tread of the treated rails.

The accompanying illustration gives a view of the treated and untreated portions of the same rail, the corrugations on the untreated portion being clearly discernible. The rail in question is on a curve of 300 feet radius, and before being treated the corrugations were entirely removed from both the treated and untreated portions. As previously stated, pronounced corrugations have reappeared on the untreated portion whilst the treated portion is immune.

Showing Effect of Wear on a Part of a Rail which has been Treated Sorbitically and a Part Not so Treated.

A similar experience is reported from Birmingham, where corrugations were removed from a length of rail, part of which was afterwards treated by the "*in situ*" process. Up to the present time there is no trace of corrugation on the treated portion, whilst very marked corrugations have reappeared on either side thereof on the untreated portion.

In introducing the "*in situ*" treatment, the licensees have been confronted with a number of pertinent queries in regard to the possible effect which the hardening of the rails may have upon adhesion and braking, welded joints, etc., and it is desirable that the replies to these questions which can be made should be generally known.

In developing the "*in situ*" process particular attention has been paid to the possible loss of adhesion due to the production of an over-hard rail surface, and from experiments carried out under actual service conditions it is evident that no trouble is to be apprehended in this direction. The greasiness of rails under certain atmospheric conditions renders braking a skilful operation, but this condition is common to all qualities of rail steel, and the "*in situ*" process in no way accentuates the difficulty.

The same may be said in regard to coasting on

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gradients, particularly without the use of track brakes; the conditions governing retardation and safety depend principally upon the human element, i.e., upon the skill and resource of the motorman, independently of the wheel and rail contact, and in such instances, whether the rail surface be hard or soft, the judicious use of brake sand is essential.

Unfortunately, from several points of view, tramway rails are never free from road detritus, and a clean contact between wheel and rail is rarely, if ever, obtained. This condition is one which contributes, to a much larger extent than is generally understood, to the rapid rate of wear of tramway rails and wheel tires. The fact is that there is excessive adhesion between tramway wheels and rails in full contact—due to the presence of detritus—and the effect of hardening the rail surface by the "*in situ*" process is to increase the resistance to rapid wear without loss of efficient adhesion. It is well known that no difficulty has been experienced in regard to adhesion and mechanical braking on manganese steel rails—a fact which speaks for itself.

In order practically to demonstrate that the effect of the hardening of the rails by the "*in situ*" process is not conducive to wheel slip, experiments have been carried out by operating a car on an up-gradient, over a length of track a portion of which had been treated by the "*in situ*" process, with the front motor cut out and with the brakes applied to the front wheels; the slip of the rear or driving wheels was continuous, and no more pronounced on the treated length of track than on the other portion.

The "*in situ*" treatment may be applied to rails with welded joints without detriment to the joints. As it is instantaneous at any one point, the heat applied does not approach the welding temperature, and does not penetrate deep enough to injure the weld.

The question of the depth and regularity of the treatment occasionally arises, and in connection with this it may be said that these conditions depend largely upon the composition and structural condition of the rail itself. The depth of the treatment is dependent upon the heat conductivity of the rail, and hardness and uniformity will vary according to the percentage and disposition of the carbon in the steel. Original irregularities of this description will in no way be accentuated; in fact, the treatment is such as to neutralise inherent defects of this character.

It has been suggested that once the hardened surface has been worn through, irregular wear will occur in consequence of the minor variations in its depth, a condition inseparable from the tempering of steel; but actual results indicate that owing to the resistance to wear the life of the rails will be prolonged to such an extent as to render the possibility remote and beyond the scope of the present economical aspect.

The interest in the process is general; the contracts already secured from some of the largest undertakings in the kingdom, the increasing number of repeat orders, and the extensive list of negotiations at present being completed is sufficient evidence that the exceptional economical possibilities of the treatment are appreciated.

In view of the high cost of rails, track materials, and labour it is obvious that the "*in situ*" process, ensuring as it does a greatly extended life to the rails, and a decidedly retarding effect on the development of corrugations, will prove an attractive practical and commercial proposition to tramway undertakings.

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INTERNATIONAL TRAMWAYS UNION.

Reorganisation After War.

The following communication, signed by the president, M. C. de Burlet, and the general secretary, M. H. Camp, has been sent to members of the Union Internationale de Tramways et de Chemins de fer d'Interet Local, from the offices, Rue d'Arlon, 23, Brussels:

It is with a feeling of profound satisfaction that the Executive Committee, after a long and painful separation, is again able to renew communication with the members of the Union. The events of the terrible war have left their mark upon our association, and radical changes are necessary in order to maintain the Union and to ensure that the results of collaboration, already far too long interrupted, are not irretrievably lost. In taking account of the new situation, the Executive Committee, at their meeting on March 22 last, decided that the only possible solution was to be found in disbanding the Union and in re-forming it immediately with members only of the allied and neutral countries. A general assembly being felt to be impossible at that moment, the Executive Committee assumed the responsibility of proposing the measure, leaving it to be ratified as soon as circumstances permit.

Thanks to the care with which our predecessors managed the finances, the Executive Committee, which has directed the business of the Union during the period in which the office of the association was separated from the greater part of the members, have found the necessary funds to maintain the organisation. This result has been obtained by careful economy, and in spite of the fact that since 1914 no subscriptions have been received. The intention of the Executive Committee is to renounce the annual subscriptions for the years 1915, 1916, and 1917, but in order to permit the resumption of our work and the sending of reports, documents, etc., the committee invite members to send to the general secretary the subscriptions due for the years 1918 and 1919.

Article 12 of the statutes fixes the sums to be paid by the Corporation or company members on the following scale:—

For annual receipts—	Per annum
(*a*) Of not less than 1,000,000 fr...	50 fr.
(*b*) From 1,000,000 fr. to 2,000,000 fr.	100 fr.
(*c*) From 2,000,000 fr. to 3,000,000 fr.	150 fr.
(*e*) From 3,000,000 fr. to 4,000,000 fr.	200 fr.
(*f*) From 4,000,000 fr. to 5,000,000 fr.	250 fr.
(*g*) Above 5,000,000 fr.	300 fr.

The annual subscription for effective personal members and associated members is 20 francs, and for associate members, firms, etc., interested in the tramway industry, it is 100 francs.

Considerable changes are or will be inevitable in the domain of tramways and light railways, as in all other branches of industry, and it is of the highest importance at the present time that firms and persons concerned in this industry should exchange experiences. The committee therefore count upon the active co-operation of all the members. They are happy to state that marks of sympathy and expressions of hope of the revival of our association have been received at the office from various quarters.

The Committee hope to meet with the same sentiments among all their members, and that the work commenced thirty-four years ago may be continued for the greatest good, not only of the tramway undertakings but of all that great public directly or indirectly interested in the development of public transport.

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THE EDITOR will be glad to consider articles by experts. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, JUNE 19, 1919.

Supply of Electricity. The terms of the Electricity Supply Bill are now before the country, and as was to be expected their reception has been somewhat mixed. There is, of course, no difference of opinion as to the desirability of providing the country at large with an abundant and cheap supply of electricity for all purposes. Criticism arises on the methods, and in a complex scheme which touches so many interests numerous differences of opinion are only to be expected. Speaking generally, the scheme, if properly worked, is calculated to attain the desired end, but there are possibilities of failure or only partial success in the fact that so many of the powers conferred on the new bodies to be set up are permissive, not mandatory. The word "may" flourishes all over the Bill; "shall" is much less in evidence. It is quite probable that the explanation is that in this way the Government hope to disarm much of the opposition to the Bill, particularly that from local authorities. Indeed, some of the municipalities are, we believe, of opinion that their case has largely been met, and no doubt further attempts to enforce that case will be made at the Committee stage of the Bill. Another branch of opposition to be reckoned with is that of power companies, engineering bodies, and some classes of manufacturers to the creation and powers of the proposed District Electricity Boards. There is less objection to the central general controlling body, the Electricity Commissioners, but in the District Boards the supporters of individual initiative and enterprise see an enormous development of bureaucratic government and possibilities of hindrance and stagnation. It is unfortunately true that any national scheme under State auspices is open to objections of the kind; we have another example of it in the Ministry of Ways and Communications Bill. At the same time, if we are to have organisation, co-operation, efficiency, economy, and development on a national scale, something must be risked, and the tendency of the times is to risk it. Parliamentary control will always be available, and when so much in the practical direction is at stake, it ought to prove more efficient than it has often been in the past.

The Bill and the Experts. It may be noted that some controversy may arise in connection with the points on which the Bill differs from the recommendations of the three committees of experts who reported to the Government on the subject. The Electric Power Supply Committee, over which Sir Arch. Williamson presided, and which made the proposals for the organisation that is largely embodied in the Bill, was advisedly described by the Home Secretary when moving the second reading as a very powerful Committee, representative of practically every industry interested in electricity. Sir A. Williamson himself, speaking in the debate which is reported in this issue, specially criticised the proposal of the Bill that the country may be divided into electricity districts, instead of (as proposed by his Committee) shall be so divided. He pointed to the danger that one part of the country might be divided and another part not divided into districts under District Boards. He also objected to local financing, holding that it should be national in the first place. Probably there will be much to say on these as

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well as other matters. Nothing definite has emerged so far as to the effect of the Bill on power supply for tramways and railways in particular, but that aspect, like others, will no doubt be discussed in Committee. To get the Bill passed this year will require good-will and conciliation. On the single question of transferring all powers of the Board of Trade under the Bill to the Minister of Ways and Communications strenuous opposition is threatened by those who have so keenly criticised the Bill for the establishment of that Ministry.

London Traffic Board Wanted.

In human affairs, neglected opportunities often come back in the shape of dire necessities. The present condition of London transport facilities is another instance. In 1903 the Government then in power appointed a Commission to inquire into London traffic conditions, and two years thereafter the Commission issued its report. Nothing was done. The report, which, including the expense of the Commission, cost £20,000, not to speak of the endless labours of able men, was shelved. One of the principal recommendations of the Commission was the appointment of a London Traffic Board, and the proposal suited nothing but the public interest. Politicians considered that there was little to be gained by them from the setting up of a non-political body such as was proposed, and they played for safety by a policy of careful inaction. As a matter of fact, neither the Progressive nor the Moderate party in the County Council were enamoured of the proposal, as it would introduce a body of experts whose views would not be subservient to the exigencies of party politics. Moreover, the influences in the city, the interests of the railways and other transport companies were then dead against it. During the years between 1905 and 1914, the mutually confusing and contradictory activities of the authorities directing the tramway, tube, railway, and omnibus services continued, creating a problem growing ever more formidable. It is useless to blame the war for the trouble. One might even maintain the proposition that, but for the war, the congestion of London traffic would have been worse than it is, and support the argument with strong proofs. A Traffic Board, almost any kind of Board—democratic or bureaucratic, autocratic or plutocratic—would have done something to improve the conditions of London traffic, and certainly prevented the evil from attaining the proportions it has reached in the absence of any control whatever. Absence of an active public spirit in London is the root cause of the whole difficulty. The Metropolitan district is a conglomerate of business places and workshops and domestic habitations and dormitories. Unification of the two ideas in one conception of London citizenship has yet to be attained by the vast majority of the people of all classes. Under such circumstances self-government by elected representatives is an illusion and a sham. In consequence, London local government has become the battleground of contending factions. One party dislikes the exercise of municipal enterprise, and pursues the aim of destroying the County Council Tramways department with unwearying hostility. Another faction aims at municipalising every service, but is unable to construct a plan which will effect the purpose without trenching upon the rights of free citizens. And now Labour has come up to demand control of all public services in its own interest. Is it not time we had done with all that, and the sane, freedom-loving, ordinary Englishman had his say in the matter? There is no essential opposition between the different forms of transport service at present existing in London. The tramways are a vital necessity to London life, and they need, as the London County Council has now admitted, the auxiliary of the omnibus. The tube and other railways serve to relieve the congestion of the street traffic; without them London business could not be carried on for a week. Where all are necessary to the common welfare, opposition and competitive hostility are foolish and futile. Co-ordination of all the services, in whatever hands the various sections may be, is imperatively demanded by the need of the whole community. However imperfect its constitution might have been, had a London Traffic Board been set up in 1905 it would very largely have averted our present troubles, and taken the necessary action under pressure of public opinion. To London citizens has come the

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rare good fortune of a second opportunity in the appointment of a Select Committee to investigate their needs and to explore all avenues of improvement. Upon the committee rests a heavy responsibility, but in the present condition of London transport their work can hardly fail to result in benefit to a sorely tried public.

The Select Committee on London Transport.

The relegation to a Select Committee of the House of Commons of the task of reporting upon the increases of fares and the overcrowding upon the London Underground Railways, the County Council tramways, and the omnibuses, is to be welcomed because it will enable the several cases to be inquired into in an efficient manner. That result was not achieved by the proceedings before the Committee of London Members, who, according to a statement made to an interviewer by Mr. Purchase, their joint secretary, came to the decision that "although a case had been made out by the undertakings, their general impression was that the case had not been fully made out." On the whole it may be affirmed that the railways and the omnibuses came out of the informal inquiry better than the County Council did. A contributory cause was that the traffic group had put the public in possession of the features of their case before the inquiry took place, and continued to do so during the sittings. For this result credit is due to their publicity department, whose many years' experience of the value of displayed advertisements in newspapers had taught them that the public quickly appreciate facts when properly placed before them. Therefore it was not surprising to observe that the companies kept the public informed of the difficulties which they have had to encounter in the form of increased labour costs, shortage of rolling stock, and the enhanced charges for fuel and materials. This method of appeal by the owners of public utility services has long proved a success in the United States, and it is surprising that the County Council were not awake to its importance, instead of advertising facilities for reaching Hyde Park and Hampstead Heath. One circumstance disclosed by the evidence of chairmen and officials, and also by the advertisements, leads us to ask the reason why all the undertakings refrained from calling a spade a spade in regard to one of their chief burdens. Apparently in no case was the eight-hour day mentioned as such. Its bearing upon the difficulties of the County Council is shown by the fact that the 48-hour week is estimated to involve an outlay of £360,000 per annum, and that an increased revenue of over a million pounds has to be secured during 1919-20 in order to meet the expenditure and usual charges. It will be necessary also when evidence is given before the Select Committee for the representatives of the Council to be agreed upon the proportion of the increase in the cost per car-mile due to material and labour charges respectively. When that question was raised at the recent inquiry, the tramways manager replied that approximately one-third of the increase is due to labour, while the chairman of the Highways Committee stated his impression that it is two-thirds. If the public possessed as clear a knowledge of the facts as Sir A. Geddes' reply to the London Members' deputation disclosed upon his part, there would be no need for further inquiry. It should be accepted, however, as being likely to emphasise in an overwhelming manner the necessity for the setting up of a London Traffic Board. As the President of the Local Government Board remarked to the deputation, "the whole position shows how lamentable is the lack of a transport authority to deal with these things."

LONDON TRAMWAY EXTENSIONS.

At a meeting of the London County Council on June 3, it was decided to proceed with the construction of authorised tramways in Wandsworth and at Lee Green. Both extensions were decided upon in July, 1914, but the work had to be postponed owing to the war.

The Wandsworth extension comprises tramways in High Street and East Hill, and a junction line from High Street to the Garratt Lane tramways, the original estimated cost being £26,000. In 1914, owing to difficulties in connection with certain street improvements, it was not possible to proceed with the whole of the tramways, but tenders were invited, and the offer of John Mowlem and Company, Limited, was accepted for a part of the tramways in East Hill between the existing terminus and Fairfield Street. Revised estimates prepared on the basis of present prices are as follows:—Track work, including rails, special work, paving and alterations to mains, £46,400; sub-station equipment, £120; cables, £500; ducts, £150; feeder pillars, £100, making a total of £47,290.

By the Eltham extension the Lee Green tramways communicating with the Thames Embankment, *via* Blackfriars, will be taken to the London County Council boundary in that part of the south-eastern district. At Eltham the extension will join the tramways which run to Woolwich. If the extension had been carried out during the war it would have greatly facilitated the transport of workers to the Arsenal. The capital estimate in 1914 was £57,025. The estimates now framed give a total of £134,710, made up as follows:—Track work, including rails, special work, paving and alterations to mains, £98,000; sub-station equipment, £360; overhead equipment, £10,000; car equipment, £2,340; cables, £17,730; ducts, £3,880; feeder pillars, £400.

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JOINT INDUSTRIAL COUNCIL FOR THE TRAMWAY INDUSTRY.

A Preliminary Committee.

Under the terms of the agreement of March 20, 1919, between the tramway undertakings and the employees, which were given in our issue for April 10, 1919, it was provided that, pending the final establishment of the Joint Industrial Council, a Joint Committee should be set up. This Joint Committee consists of six members representing the employers and six members representing the employees, including three representatives of the Municipal Tramways Association, three representatives of the Tramways and Light Railways Association, and six representatives of the National Transport Workers' Federation.

Two meetings of the Joint Committee have been held, one at Birmingham and one at Sheffield on May 8. At the first meeting, Mr. A. Baker, general manager of the Birmingham Corporation Tramways, was appointed chairman, and Mr. E. Bawden, president of the Amalgamated Association of Tramway and Vehicle Workers, was appointed vice-chairman.

The Joint Committee have decided upon the following rulings, which have been published in the May issue of the *Tramways and Light Railways Association Journal*:—

War Bonus.

That it be understood that as from the settlement of the agreement the 30s. war bonus be paid in respect of the reduced working week of 48 hours.

Clause 1 (*a*).—That the words "working week" shall be deemed to mean six days. That the words "signing on" and "signing off" shall be deemed to mean the same periods as now in vogue in respect of these allowances.

Clause 1 (*b*).—Regarding permanent way men whose hours of labour vary during certain periods of the year, the principle to be adopted of totalling up the number of hours each week for the whole year and then taking the average.

Clause 1 (*b, c, d*).—Regarding any other matters arising in connection with Clauses 1 (*b, c, d*), these to be dealt with as and when occasion arises.

Clause 2.—It having been suggested that the clause be interpreted to include every employee in the tramway industry whose working conditions are not governed by any other Trade Union, it was decided that the question be left over to be dealt with if a difference arose in any particular undertaking.

With regard to permanent way men who are "rained off," it was agreed that in the event of rain the employers should be at liberty to call upon the employees to continue to work; if they refused they would forfeit their claim to a full week's pay, or the employers could transfer them to such other work as might be suitable for them.

With regard to the guaranteed working week affecting undertakings where it had been the custom to close the depots, or to stop permanent way men during certain holiday periods without pay, it was agreed that those conditions be considered sasqui valent to those under Clause 10, and that the undertakings hould be at liberty to continue these arrangements as heretofore without incurring liability for payment of a full week's wage.

It was agreed that the clause should only apply to permanent way men who are recognised as being on the regular staff.

With regard to "watchmen," it was agreed that the agreement be deemed not to apply to these men, but that their hours of labour should not be lengthened, nor their conditions made worse due to the granting of the new conditions of employment to other employees.

The question as to the method of dealing with overhead equipment and other men who worked on shifts was discussed, and it was agreed that these men should be paid Sunday rates for any work they are called upon to perform between midnight Saturday and midnight Sunday; that night staff employees be paid Sunday rates for any work carried out by them between midnight Saturday and midnight Sunday.

The Joint Committee decided that the bonus should be taken into account in the calculation for payment of "special rates" or "added time," that is, Sundays, Bank Holidays, Christmas Day.

Procedure.

The question was raised as to whether the Committee were in order in proceeding to interpret the agreement clause by clause, or whether they should simply deal with cases referred to them where difference had arisen.

It was resolved that this committee be deemed to be the "Joint Committee" referred to in Clause 1 (*d*) and Clause 12 (Terms of Agreement, March 20, 1919).

It was resolved that the various undertakings be advised that it is open to the National Transport Workers' Federation and its constituent unions to approach any undertaking in order to settle any dispute arising out of the terms of agreement, and that, failing settlement, the matter be referred to this Joint Committee, subject to such settlement not being prejudicial to the principles laid down in the agreement.

CONFERENCE OF TRAMWAY COMPANIES AS EMPLOYERS.

Constitution Adopted.

A standing conference of company employers who are members of the Tramways and Light Railways Association has been formed, with the following constitution:—

(1) The name of the conference is "The Conference of Tramway and Light Railway Companies."

(2) The objects of the conference are (*a*) to carry on negotiations and arrange agreements with the Government, trade unions, and others upon questions arising out of labour problems, including questions of wages and war wages; (*b*) to elect members as representatives of companies to the National Industrial Council for the tramway industry; (*c*) otherwise to represent companies in such matters concerning the tramway and light railway industry as do not fall within the scope of the objects of the Tramways and Light Railways Association.

(3) The office of the conference shall be the office of the Tramways and Light Railways Association, or such other office as the conference may from time to time determine.

(4) The secretary of the Tramways and Light Railways Association shall act as first secretary to the conference. The secretary shall be remunerated for his services out of the funds of the conference.

(5) The members of the conference shall be duly authorised representatives nominated by tramway or light railway companies in the United Kingdom, being members of the Tramways and Light Railways Association. Each company shall be entitled to one representative, and each representative or member of the conference shall have one vote in respect of each company he represents on any matter put to the vote by the conference. Voting shall be by show of hands or otherwise as the conference may determine.

(6) The conference may carry on its business either by meetings to which all members shall be summoned, or by means of committees or otherwise, as the conference may think fit.

(7) All committees shall report to the conference before any action is taken on matters connected with Labour which may be intended to be binding upon the companies represented by the members of the conference. No company shall be bound by any such action of the conference unless that company shall by written notice to the secretary of the conference have consented to be bound by such intended action.

(8) Each company represented on the conference shall as and when requested pay to the Secretary of the conference a call towards the funds of the conference based upon the number of cars owned or worked by such company, or upon such other basis as may be prescribed from time to time by the conference. Provided that no company shall be bound in any one year to pay a larger sum than 10s. in respect of each car owned or worked by such company during that year.

(9) A quorum at any meeting to which all the members of the conference may be summoned shall consist of not less than seven members present at such meeting, and the decision of the conference shall be communicated to all the members.

(10) The secretary shall submit an annual statement to the conference showing how the funds of the conference have been utilised.

Glasgow Corporation Tramways.—The following are the traffic statistics for the Glasgow Tramways department for the year which closed on May 31, compared with the figures for the previous year:

	1918-19.	1917-18.	Inc. or Dec.
Track mileage (single) ...	196¼	196¼	
Car mileage	25,581,547	26,261,231	— 679,684
Traffic receipts	£1,527,487	£1,404,110	+ £123,377
Traffic receipts per car-mile	14·331d.	12·832d.	+ 1·499d.
Per passenger	·790d.	·782d.	+ ·008d.
Passengers carried ...	464,246,677	430,946,566	+ 33,300,111
Passengers carried per car-mile	18·148	16·409	+ 1·739

The following statement gives the number of passengers carried at each fare:—

	Year to May 31, 1919.	Year to May 31, 1918.
½d.	290,080,376	272,902,138
1d.	121,285,355	110,608,645
1½d.	31,750,977	28,462,112
2d.	10,348,905	9,332,956
2½d.	4,846,252	4,351,666
3d.	2,520,384	2,215,506
3½d.	2,952,145	2,696,504
4d.	462,283	377,039
	464,246,677	430,946,566

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BOURNEMOUTH CORPORATION TRAMWAYS.*

By I. Bulfin, B.A., A.M.I.C.E., M.I.M.E., M.E.E. (General Manager, Bournemouth Corporation Tramways).

The British Electric Traction Company in the year 1899 obtained their Light Railway Order for the construction of 3¾ miles of railway in the Poole area, i.e., from the County Gates Bournemouth boundary in a western direction to Poole Station, and opened the same for traffic in 1901. In the year 1900 the same company promoted a Tramways Act (Christchurch and Bournemouth Tramways Act, 1900) for a tramway connecting Bournemouth and Christchurch in an easterly direction. This latter Act included the tramway from the Hotel Metropole to Pokesdown Station in the Bournemouth area. The Bournemouth Corporation, in view of the B.E.T. Company holding the light railways on the western side and their endeavour to obtain a tramway concession on the eastern side and partly in their borough, determined to apply to Parliament (as a blocking measure) for a Tramways Bill for their own area, and promoted in the same year the Bournemouth Corporation Tramways Order, 1900. Parliament granted powers to the Bournemouth Corporation to construct the lines in their own area, and the line Metropole to Pokesdown in the B.E.T. Company's Act was held in abeyance subject to the Bournemouth Corporation constructing the line within two years. The Bournemouth Bill was only a blocking measure, and the scheme was for a single line and passing places on the whole of the main route, and in view of the fact that, if the tramways were not constructed within two years, their powers lapsed and a company had powers to run trams in Bournemouth area, it became necessary to reconsider the whole scheme and to arrange for a double line right through. This necessitated the widening of roads, compulsory powers for acquiring lands, and the preparation of plans and contracts for a large system, including depots, generating station, etc. The delays occasioned by these alterations and in obtaining the necessary powers resulted in the two years expiring before substantial progress was made, with the result that in 1902 the B.E.T. Company issued an injunction against the Bournemouth Corporation constructing these lines, as their powers had lapsed, and by an Order of the Court of Appeal dated July 15, 1902, this injunction was upheld. In order to retain the tramways in their own area it became necessary to buy out the B.E.T. Company both on the Poole and the Christchurch sides. The case went to arbitration, and a price was fixed and agreed. Owing, however, to trouble with the Dorset County Council, it became necessary for the Poole Corporation to buy the Poole line, and they leased these lines to Bournemouth for a period of 30 years, the Bournemouth Corporation agreeing to pay as rent a sufficient sum per annum to pay interest and sinking fund on the purchase price, and at the expiration of the 30 years' lease the Poole light railway would become the property of the Poole Corporation free of all costs.

The amended Bournemouth scheme for tramways was for a double line of tramways through the whole of the main route run on the trolley system, but in the centre of the town they decided to instal the "conduit" system (being equal to a length of some 2¾ miles of single track). The system was side slot running to centre slot at all special work, identical in every way with the centre slot London County Council system, but laid and run prior to the London County Council system. The conduit system was run for some ten years, when, owing to heavy wear of rails and conductor tees, it became necessary to re-lay this portion of the line, and in going into the cost of renewing same as a conduit system, or changing over to the trolley system, it was decided after very careful consideration of all the points in question to abandon the conduit and run the entire system as a trolley system.

The main lines in Bournemouth were opened to traffic in 1902, and the side routes in 1903. The tramways to Christchurch were constructed by the Bournemouth Corporation, and opened for traffic in 1905, and in the construction of this line it became necessary to buy out the Toll Bridge Company at Tuckton Bridge, over the River Stour (a narrow wooden bridge on iron piles some 380 ft. long). This bridge was pulled down, and a ferro-concrete bridge erected—one of the first and longest ferro-concrete bridges in England carrying a double line of tramways. In 1906 the Lower Parkstone line was laid and opened for traffic. At the present time the route mileage of the syetem is some 23 and the length of single track over 33 miles, and runs in three boroughs—Poole, Bournemouth, and Christchurch.

The current for the tramways in the Bournemouth area is supplied from the Corporation station. The plant consists of four Lancashire boilers with mechanical stokers, four Belliss and Morcom triple expansion engines, 500 to 600 H.P. each, coupled direct to 4 B.T.H. multipolar dynamos. The condensing plant was supplied by Messrs. Belliss and Morcom. There is sufficient room for the equipment of a further 50 per cent. increase of plant in the station. The whole of the water supply is obtained from an artesian bore 300 ft. deep, and the water is raised by compressed air, steam and electrically driven.

There are four depots and car sheds situated in different parts of the system. The rolling stock consists of 90 cars—45 bogies and 45 single trucks; the equipments are British Westinghouse, British Thomson-Houston; magnetic track and rheostat brakes are installed on all cars.

The maximum gradient is 1 in 12, and the sharpest curve some 40 ft. The gauge is 3 ft. 6 in. right through the system.

The current in the Poole area and the Christchurch section is supplied by the Bournemouth and Poole Electric Supply Company, Limited, owing to prior contracts entered into by the B.E.T. Company, and which the Bournemouth Corporation had to accept when taking over the tramways.

As instancing the growth of tramway traffic, I append particulars of yearly returns from 1903 to date.

Year.	Passengers Carried.	Revenue.	Car Miles.	Total Costs.	Surplus or Deficit.*
		£			
1903 ...	3,073,450	17,637	324,650	8,720	+ 4,826 (S)
1904 ...	9,363,985	52,445	1,002,163	29,810	+ 4,807 (S)
1905 ...	10,058,288	55,276	1,121,623	33,500	+ 7,918 (S)
1906 ...	12,617,927	73,094	1,494,261	44,062	+ 6,416 (S)
1907 ...	13,503,610	83,663	1,765,098	53,598	+ 806 (S)
1908 ...	13,991,328	86,024	1,766,068	53,163	— 385 (D)
1909 ...	13,735,267	82,017	1,748,515	55,680	— 5,416 (D)
1910 ...	14,010,647	85,684	1,794,997	55,901	— 1,755 (D)
1911 ...	14,703,679	89,569	1,784,249	57,717	— 130 (D)
1912 ...	15,121,935	91,421	1,844,507	54,841	+ 3,379 (S)
1913 ...	15,750,576	95,694	1,822,054	52,293	+10,478 (S)
1914 ...	17,182,844	104,353	1,962,352	59,011	+15,070 (S)
1915 ...	16,967,210	101,882	1,815,632	55,066	+ 9,083 (S)
1916 ...	17,577,580	107,575	1,670,702	51,794	+14,057 (S)
1917 ...	17,947,463	113,518	1,634,640	53,711	+16,275 (S)
1918 ...	20,454,597	131,673	1,657,852	62,650	+26,329 (S)
1919 ...	20,769,507	148,272	1,374,411	79,100	+32,000 (S)

* After deduction of interest and sinking fund charges.

* A Paper prepared for the Meeting of the Institution of Municipal and County Engineers at Bournemouth, 9th and 10th May, 1919.

CONFERENCE OF VEHICLE WORKERS.

The annual conference of the Amalgamated Association of Tramway and Vehicle Workers was held at the Law Courts, Cardiff, on May 20. Mr. E. Bawden, of Bradford, presided, and the delegates were formally welcomed to the city by the Deputy Lord Mayor (Councillor W. R. Smith), in the absence of the Lord Mayor. In his presidential address, Mr. Bawden referred to the success of the association in securing a 48-hour week for the employees. As far as the carters were concerned, that really amounted to a revolution, as previously they had been expected to be almost continuously at work. As to future policy, the first thing they would have to do was to see that the war bonus was merged into the ordinary rate of wages. Arrangements had been made for the amalgamation with the London and Provincial Union of Vehicle Workers, and he believed that that course would prove to be one of the best things that had ever been brought about in the interests of the transport industry.

Mr. T. Maclean, of Rochdale, was chosen president for the year.

A long discussion took place as to the legal position of the municipal authorities which had promised to pay half wages to employees who had joined the colours, the authorities having subsequently departed from that undertaking, following the lead of those who had only agreed to make up the pay of the enlisted men to the amount they earned in civil life. A resolution was passed deprecating what had been done, and pledging the Association to take the matter to the Local Government Board, and if necessary to the House of Commons.

A variety of matters were discussed at the concluding session. There was a debate with reference to the formation of the Joint Industrial Council, and the Council approved the proposal of the executive, which was that, for the time being, the executive council should have ten representatives on the workmen's side of the National Industrial Council and that the branches should be allowed to nominate five members. In the discussion on wages it was stated that the executive were not attempting to standardise wages. The policy was to establish a minimum. On the standardisation of wages of tramway workers, Mr. T. Hirst (general secretary) said that the desire was to level up wages. Cardiff and Newport were by no means the lowest paid centres, but were below Birmingham and other large centres, and the aim was to bring them up to the higher level. He warned members that they could not by a strike or any other means obtain all they wanted at one jump.

During an interval, Mr. Arthur Ellis, general manager of Cardiff Corporation Tramways, was welcomed to the conference. He in turn welcomed the delegates to Cardiff, and remarked that the most cordial relations had always existed between himself and the officials of the association. Mr. Hirst, in reply, said that Mr. Ellis had always been in the forefront of tramway managers in the country in recognition of the officials of the association.

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THE NATIONAL ELECTRIC POWER SCHEME.

The long-promised Electricity Supply Bill has at length been brought forward by the Government, and in the House of Commons on May 14 it was, after four hours' debate, read a second time. As is well known, the delay in introducing the measure was largely due to the regretted illness of Sir Albert Stanley, President of the Board of Trade, who had a large share in the preparation of the Bill, and who would have been in charge of it in the House of Commons. His place was taken on May 14 by Mr. Shortt, the Home Secretary.

PROVISIONS OF THE BILL.

The Bill is a long and complex measure, extending to 45 clauses, and a large proportion of it is taken up with the details of the organisation proposed to be constituted. In broad outline the proposals follow closely the recommendations of the report of the Electric Power Supply Committee, over which Sir Arch. Williamson presided. The following is a summary of the main provisions of the Bill.

ELECTRICITY COMMISSIONERS.

For promoting, regulating, and supervising the supply of electricity there will be established a body to be called the Electricity Commissioners, who will act under the directions of the Board of Trade. They will not exceed five in number, and will be appointed by the Board of Trade, who will also determine salaries. That Board will exercise their electricity powers through the Commissioners. The latter may conduct experiments for the improvement of methods of electric supply, and may appoint advisory committees.

DISTRICT ELECTRICITY BOARDS.

The Commissioners may, after holding local inquiries, by special order create districts, and constitute for each district a District Electricity Board. The Boards will include representatives of local authorities, companies, and persons who are authorised undertakers in the district, of large consumers of electricity, and of labour, and where any Councils, not being authorised undertakers, provide financial assistance to the Boards, of representatives of those Councils. The constituting Order may provide for the appointment by the Commissioners of a person experienced in the control of large industrial undertakings as chairman of the District Electricity Board, and for the remuneration out of the revenues of the Board of any of its members.

DUTIES OF BOARDS.

It will be the duty of each District Electricity Board to provide a cheap and abundant supply of electricity, and for that purpose the Board shall have powers as to

(*a*) The acquisition of generating stations.
(*b*) The acquisition of main transmission lines.
(*c*) The supply of electricity (including the construction of generating stations, main transmission lines, and other works).
(*d*) The acquisition of the undertakings or parts of the undertakings of authorised distributors and power companies.

In this work every Board will comply with any directions given by the Commissioners.

ACQUISITION OF GENERATING STATIONS.

From the date of the Order constituting a Board all generating stations within the district, other than private generating stations, and such main transmission lines as may be specified, will vest in the Board, subject to the payment by the Board of the standard price. That price, in the case of station or line belonging to a local authority, will be annuities of such amount as will be required to indemnify the local authority against their liabilities for interest and sinking fund. The price in the case of a station or line belonging to a company or person, will be the sum certified by the Commissioners' auditor to be the cost of construction and the acquisition of site, less depreciation. On a Board acquiring a station they will be under obligation to supply to the authority or company from whom it is transferred electricity not less in amount than could have been generated by the authority or company at a price not greater than that at which it could have been so generated, any dispute to be determined by the Commissioners. When a station or line has been acquired, the Board may agree with the former owner that such owner will work and maintain it on behalf of the Board.

NEW GENERATING STATIONS.

It will not be lawful for any authority, company, or person except a District Electricity Board to establish a new, or extend an existing generating station, without the consent of the Commissioners. Exemptions are provided for private generating stations.

SUPPLY OF ELECTRICITY.

A District Board shall have power to supply electricity within their district subject to two limitations. They are not to supply (*a*) in any area forming part of the area of supply of authorised distributors without their consent, except to lighting authorities, or to railway, tramway, canal, or inland navigation companies or authorities for the purposes of traction; or (*b*) in any part of the area of supply of a power company for any purpose for which the company are authorised to supply, without the consent of the company. The Board of Trade may dispense with the consent if it is unreasonably withheld.

TRANSFER OF UNDERTAKINGS.

Any local authority being authorised distributors may agree with the District Board for the transfer to the Board of the whole or part of the undertaking, payment as in the previous case to be by annuities. The right of local authorities to purchase undertakings is vested in the District Boards. The latter may also acquire the whole or part of the undertaking of any authorised undertakers, not being a local authority, by agreement.

The Commissioners have power by Order to require any authorised undertakers to give specified reasonable facilities for the supply of electricity, and if the undertakers are unable or unwilling to comply, the Board of Trade will have power to order the transfer of the undertaking to the District Board under the terms of Section 2 of the Electric Lighting Act, 1888, or to confer on the District Board power to supply within the area of the undertakers.

In exercising their powers a District Board may lease their undertaking. Provision is also made for compensation for deprivation of employment.

TRANSITORY PROVISIONS.

The Board of Trade may, before the establishment of a District Electricity Board and two years afterwards, construct any generating station, etc., and exercise any powers of the District Board. The Treasury may issue to the Board of Trade any sums not exceeding £20,000,000 for the above purposes or for working capital. The money may be borrowed by Exchequer Bonds. Two years after the establishment of the District Board the works so constructed will vest in them, suitable payment to be made. Between the passing of the Bill and the establishment of the District Boards authorised undertakers may carry out arrangements for mutual assistance.

AMENDMENTS OF ELECTRIC LIGHTING ACTS.

There will be transferred to the Electricity Commissioners the powers of the Local Government Board and other bodies with respect to the sanction of borrowing. Where the consent of the Board of Trade is obtained to the placing of an electric line above ground, the consent of the local authority will not be required. District Boards and authorised undertakers will be entitled to place electric lines below ground across any land and above ground across any land other than building land, in cases where that is otherwise lawful. The prices charged by District Boards will be such that the receipts are sufficient to cover expenditure, including interest and sinking fund, with such margin as the Commissioners allow. The latter may regulate the prices with a view to securing that the benefits of any reduction in cost shall enure to consumers. They may also require any authorised undertakers to alter the type of current, frequency, or pressure employed. Anything which under the Electric Lighting Acts may be effected by a Provisional Order confirmed by Parliament may be effected by a Special Order made by the Commissioners and confirmed by the Board of Trade.

FINANCIAL PROVISIONS.

Every District Board is to establish a fund for receipts and payments, and to submit an annual revenue account and a report to the Commissioners. For the purpose of payment of stations, etc., acquired, where the cost is to be spread over a term of years, a District Board may, under the Commissioners' regulations, borrow money by the issue of stock. Authorised undertakers, local authorities, and companies in the district may subscribe. The Commissioners may lend to a District Board or any authorised undertakers money not exceeding in the aggregate £25,000,000 if the Commissioners are satisfied that the Boards or undertakers cannot otherwise raise the money. This advance is to be issued out of a special fund under the charge of the Commissioners, to be called the Electricity Loans Fund, and raised by the issue of electricity stock. The Commissioners will apportion the amount by which their estimated expenses exceed the estimated receipts among the District Boards, the latter to pay to the Commissioners the sums apportioned. During the first five years, however, the amount

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of the excess will be paid out of moneys provided by Parliament, these advances to be repaid in three years. Money received by the Commissioners will be paid into a separate fund, out of which salaries, etc., will be paid.

GENERAL.

Section 4 of the Conspiracy and Protection of Property Act, 1875 (which relates to breaches of contract by persons employed in the supply of gas or water) is extended to persons employed by District Electricity Boards and by authorised undertakers. The Commissioners may hold inquiries and order the attendance of witnesses. The Board of Trade and the Commissioners may make rules in relation to proceedings before them. Special Orders made by the Commissioners will not have effect unless confirmed by the Board of Trade, and before any Special Order comes into force it must be laid before each House of Parliament for not less than 30 days, and if either House presents an address against the Order, no further proceedings can be taken thereon. There are separate clauses applying the Bill to Scotland and Ireland.

THE MINISTRY OF WAYS AND COMMUNICATIONS.

The following important clause comes almost at the end of the Bill:—In the event of a Ministry of Ways and Communications being established by an Act passed in the present session of Parliament, all the powers and duties of the Board of Trade under this Act, and under the Electric Lighting Acts, and under any Order or Special Act relating to the supply of electricity, shall, as from such date as His Majesty in Council may fix, be transferred to the Minister of Ways and Communications, and accordingly references to the Board of Trade in all such Acts and Orders shall be construed as references to the Minister.

DEBATE IN THE HOUSE OF COMMONS.

The Bill came on for second reading in the House of Commons on May 14. The following is a summary of the discussion that then took place.

Mr. SHORTT, the Home Secretary, in moving that the Bill be read a second time, said that its main object was to reorganise the supply of electricity for industrial purposes. Until the beginning of this century practically the whole of the legislation which dealt with electricity was passed at a time when the real use of electricity was unknown. The Acts of 1882 and 1888 were totally ineffective for the present development of the electrical industry. One result had been that electricity was managed within an area which was substantially the area of the local municipality—small areas, numerous areas, and all of them developed in their own way, and all of them starting their work and their method of production and distribution in their own way. The result was that we were faced with a state of things in which there was a very large number of small electrical concerns, each of them feeding a small area, and an area not chosen because of its peculiar adaptability, or because it was a convenient area necessarily, but chosen solely and simply because of its boundaries for local government. That in itself condemned the existing state of things. There were at present some 600 different electrical works in this country. There were in London alone 70 sets of works and 70 distributing agencies, all of a totally different description, and were not capable of being co-ordinated or of co-operating. In London there were ten different systems of frequency and twenty-one different systems of voltages, and any number of transport systems, and those concerns had three different systems of generating and distributing their electricity. In the case of a breakdown of one, unless it was within reach of another of the same frequency and the same voltage, they could not come to each other's rescue or co-ordinate for the purpose of economy. Altogether, the system was one which was about as bad as could possibly be conceived. The case of railways was somewhat analogous to the present state of electrical production and distribution. Some sixty years ago there were about a thousand railway companies in this country, and it was plain where they had a thousand different railway companies serving a country the size of ours, with their different directors and staffs and other expenses connected with each individual company, that economy and co-ordination were impossible. Add the fact that the gauges of the railways were different, and interworking became impossible. The House would readily appreciate the state of chaos into which the railways of this country might have come, but fortunately the matter was taken in hand and combinations took place, and now there were about 120 companies in this country. We were at present, with regard to electricity, in the same position as the railways once were.

HOW TO GET CHEAP POWER.

It had become very clear, even before the war, what great value electrical power might be. Big consumers all over the country were calling out for cheap and efficient power, and, moreover, for a secure supply of power, because if the great manufacturer with an immense amount of capital was at the mercy of one system, and if in that system there should be a breakdown, then his works would stop. These were things only to be got by co-ordination. If they co-ordinated they got cheapness of supply, a relatively less capital outlay. Each separate concern had to erect considerably more plant than it would actually use, but if they were combined the reserve and spare plant was less, and the capital outlay was relatively less. In addition, if they had the large concentrated plant they were able to generate electricity with a great saving of coal. Over the manufactures of the country it was reckoned that about 7 lb. to 8 lb. of coal were required for each horse-power hour. With a properly erected station, sufficiently large and concentrated, they could deliver the same equivalent amount of power for less than 2 lb. of coal. In addition to that, where they had all the generating stations of an area concentrated into one place they could secure a so much higher load factor. If you have expensive machinery running all the twenty-four hours only up to 25 per cent. of its capacity, it is not being run at the best possible advantage; but if they could so arrange from the same station to deliver electricity to the trams, the railways, for lighting purposes, for machinery, for heating, cooking, and for every other purpose, they then secured a very much better load factor, and they had the machinery working instead of at about 25 per cent. of its capacity, perhaps on the average up to 75 or 80 per cent. of its capacity. Still more important, they were able to choose the site so much more advantageously if the whole of the generation was collected into one area. It was appreciated of late years much more than formerly the immense importance of having the generating station close to a large supply of water for the purpose of condensation. It was of even more importance that a big generating station should be near a river or a canal than that it should be close to a railway or coalfield, and where they had only to choose, say, a third of the number of generating sites, or even a quarter or a fifth of the number of sites, it was much easier to secure that every generating station should be constructed upon an advantageous site. It became clear, even before the war, what an immense part electrical power might play in the industries of this country and in all the amenities and all the necessities of life as well.

THE SCHEME OF THE BILL.

It was clear that something would have to be done to co-ordinate the system, to create some kind of general policy, and to secure as far as possible greater efficiency and greater economy, and for that purpose three committees were set up. The first was a Sub-committee dealing with the conservation of coal, the second was a Board of Trade Committee dealing with electrical trades, and the third was the Electric Power Supply Committee. These Committees, especially the last, pointed out the conditions governing a cheap and efficient supply of electricity. Having enumerated the chief recommendations of the Committee, Mr. Shortt went on to say that the Bill he was now moving accordingly provided, first that there should be set up a body called the Electricity Commissioners. They would be five in number, and they would be appointed by the Board of Trade. They would for all practical purposes have the conduct of the whole of the policy dealing with the electrical industry in this country. It would be their business to make experiments, to stimulate, to encourage, and to guide, and for that purpose they would have power to set up advisory committees for their assistance. Under them, and subject to their rules and regulations and directions, there would be the local area bodies, and through these local area bodies the Commissioners would have the controlling power over the whole of our electrical policy. They would be subject in many respects to the Board of Trade and, through it, to Parliament. The Commissioners would by means of local inquiries obtain the necessary information to enable them to divide the country into a certain number of areas, and those areas would be chosen and defined by having regard to the questions of generation and distribution of electricity, and also in many cases, where the use of electricity was as yet undeveloped, they would be chosen from the point of view of development and supply when they are developed. For each area there would be set up a Board. Each area would have its own Board, with its own chairman, and its own distinct authority and powers. The Boards would consist of representatives of those who were at present undertakers of electricity industries. Whether they were local authorities or companies, they would be represented upon these Boards. The consumers and labour equally would be represented, and if there was any local authority within the district which chose to subscribe to the expenses of the management of the area, they also would be represented; and provision was made for the choice of some known and trusted local gentleman of wide business experience for the office of chairman.

FINANCE.

The financial arrangements were first that *primâ facie* each district should find its own finance, and what one might call the supplemental finance would come from the national Exchequer. In the report of the Committee on Electrical Supply, the recommendation was that *primâ facie* the expense should be borne by the national Exchequer, and that any assistance should be upon the local people, but after full consideration, having regard to the general financial position of the country, the Government thought it wiser and better that each district should be responsible for its own finance, that the responsibility for the finance should be in the first place local, and that in the second place the assistance should come from the national Exchequer. That was one of the details in which they had not followed exactly the full recommendation of the Committee. The

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district boards would have power to borrow for the cost of construction of any stations they might erect, for their working capital for the first three years, and for the payment of interest until their works become remunerative. Their duty was to form a fund into which all their receipts would go, and so far as possible their duty would be so to regulate their charges so that their receipts would cover their expenditure, and any margin over and above that would be at the discretion of the Electricity Commissioners. The Commissioners would decide, if there was a margin, what margin the local district boards were to be entitled to keep and what part of the surplus profits was to go for the benefit of the consumers. So long as the receipts were greater than the expenditure, there would be no need of any contribution from the central body at all, but if the receipts were below the expenditure, then the cost would fall upon the central body. There was power for the central authority to advance money to the extent of £25,000,000, and there was further power for the central body to expend something like £20,000,000 during the transitory period while the district boards were being set up. The £20,000,000 would be repaid as and when the boards took over from the central body the work they had done during the transitory period.

TAKING OVER UNDERTAKINGS.

When the district boards were created they would take over within their area every generating station and all the main transmission lines. The intention of the Government had been, as far as possible, not to interfere with the existing undertakings. Local authorities who had their business *clientèle* would be as far as possible left, and all that would be taken over by the District Boards would be the generating stations and those things which were really part of the generating stations, and were not essential to distribution.

What was intended was to leave with the present undertakers the whole of the distribution, and the proposal was that they should by the activities of these District Boards cheapen the production at the generating stations, supply the distributors with what was really for them their raw material, namely, power in bulk, and enable them to supply to the individual consumer at a very much lower price. Therefore all that the Boards would have to purchase were the generating stations and the main transmission lines, and all the plant and machinery necessary merely for distribution, as apart from generation, would remain with the owners. Another provision was that where an undertaker was taking from the District Board in bulk, the Board were bound to supply him at as cheap a cost as he could have supplied himself if he had still been in possession of the generating station. The undertakings would be taken at a standard price, which was fixed. With regard to local authorities, the standard price was annuities, which would cover the necessary amount for sinking fund and interest; and with regard to others, it was the cost of construction and of the site, less anything for depreciation. The intention was that a fair price, having regard to all the circumstances, should be paid.

The Bill attempted, and, he thought, succeeded in carrying out in principle, if not in every minute detail, the recommendations of a Committee which, by its very *personnel*, commanded the respect not only of the House, but of the country, and whose recommendations must have the greatest possible weight. Their recommendations differed in no way from the recommendations of other Committees which had gone into this subject. Transport was essential if we were going to improve the housing in this country. For housing we must have transport. For transport we must have better motive power. Electricity was required for agriculture and every industry, and, indeed, it was only by cheaper, more efficient, and more secure power that we should be able to attain to that amount of production which was essential if we were to keep up wages and conditions of all classes of the community. Motive power was as essential as a cure for low wages as it was as a cure for bad housing.

CRITICISMS.

Sir D. MACLEAN said he hoped that at the Committee stage there would be embodied in the Bill proper safeguards, especially as the Bill would largely do away with Private Bill legislation. They were going to take away from this House, and the purview of its Committees, and transfer to a great central authority, acting in and through District Boards, very important functions. He hoped that these Boards would carry with them the same high sense of public duty, and the same complete freedom from any suggestion of corruption or undue influence, which had been one of the proudest records of Parliament in connection with Private Bill legislation. As far as the general case was concerned, there could be no doubt that it had been thoroughly made out. Lack of co-ordination had resulted in the usual overlapping, inefficiency, and high and unnecessary cost. The Bill set out to remedy that. There was another thing implicit in the Bill—that if the further development in the use of electricity could be thoroughly widespread, especially in crowded urban areas, we should undoubtedly go a long way to solve some of our most pressing health problems. The real difficulty on the Bill would arise in connection with the District Boards. He was afraid that unless the power sought in that direction was mandatory difficulty would arise. The finance was to commence in the local area instead of beginning at the top. With regard to the constitution of the District Boards, the interests of the locality might be subordinated to the trading interest if companies had too much power on the Boards. He hoped there would be adequate safeguards in that direction. It would also be necessary to see that the capital charges were not high.

Mr. GEORGE BALFOUR, who adversely criticised the Bill, referred in particular to the question of cheapening electric power. He cited the cases of a number of factories of different kinds in the country in order to show that their expenses for power were very small compared with the value of the turnover of the factories. Even if the electricity was given free, it would make no substantial difference. In regard to securing abundance of supply, that was entirely dependent on getting further transmission lines and further plants in operation. At the outbreak of the war the electrical enterprises of this country were going ahead rapidly, and if they had had the benefit of five years' development there would have been no question of introducing such a Bill as this. Let the electricity companies and the municipalities draw together, let the Commissioners under the Bill be established, and let it be known that a policy of unification was desirable, and it would be found that unification would come about quickly without having it imposed by District Boards and State regulations. The hon. Member also contended that the principal technical associations and experts of the country were opposed to the setting up of District Boards. He objected to the planting of "D.O.R.A." in perpetuity on the supply of electricity.

AN AUTHORITATIVE VOICE.

Sir A. WILLIAMSON, who was the chairman of the Electric Power Supply Committee, said that the subject had occupied the attention of that Committee for ten months. The proportions given by Mr. G. Balfour between cost for power and value of turn-over were most misleading. In illustration he cited the large consumption of electricity required for electric steel furnaces and for the fixation of atmospheric nitrogen. In regard to general supply, he said that both manufacturers and railway companies were now recognising the great advantage of union in the matter. The hon. Member proceeded to advance general arguments in favour of the use of electric power. In regard to railways, he said that the evidence before his Committee was that electricity was the cheapest motive power for local or suburban traffic, and that it was cheapest for shunting in goods yards. He believed that the electrification of long-distance main lines would gradually follow. There was also the advantage of the increased service possible on city railways instead of incurring the cost of additional tracks. In regard to factories, one of the largest items of cost in a new factory was motive power. If power could be bought much capital would be saved. The hon. Member proceeded to deal with points on which the Bill differed from the recommendations of his Committee. In particular, he mentioned that instead of a mandatory provision, as the Committee recommended, that the country should be divided into districts, the provision in the Bill was that the Commissioners might divide it into districts. If the formation of District Boards was to be optional, there was always the fear that the Commissioners might not set up the Boards in all parts of the country. That was a grave matter, and he hoped in Committee it would be fully considered. It was important that the districts should be large. In regard to profit from working, he said deliberately to the Government that they must be prepared to make a loss to begin with. As to the financial arrangements, his Committee had recommended that the money should be found by the nation, not by the locality. That was the opposite of the scheme of the Bill. He was afraid the Government proposal largely cut at the root of the success of the scheme. There were many drawbacks to putting the burden of finance on the localities. He hoped the Government would reconsider their attitude on some of these points.

Mr. WADDINGTON, while supporting the Bill generally, dissented from the estimates as to the cheapness of electricity, and from holding out a paradise which could not be realised.

MUNICIPAL OBJECTIONS.

Major BARNES moved the rejection of the Bill on the ground that it proposed to take from popularly elected local authorities their powers, and to transfer those powers to Boards created by other methods than that of popular election. He said that he represented the views of the whole of the municipalities, with the possible exception of one on the North-east Coast. He did not oppose the principle of nationalisation, but opposed the proposal that the local administration was not to be of a popular character. What they were getting was national ownership and private control.

Mr. T. THOMSON seconded the amendment.

Mr. SHORTT, replying to the discussion, maintained that democratic control was not absent at all. The District Boards were under the control of the Commissioners, who were under the control of the Board of Trade, which was under the control of Parliament.

After further discussion, a division was challenged on the amendment, but only one teller for the opponents of the Bill, namely, Sir F. Banbury, could be found, and the second reading of the Bill was accordingly agreed to.

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ELECTRICITY SUPPLY BILL.

REPORT OF THE PARLIAMENTARY COMMITTEE OF NEWCASTLE CITY COUNCIL.

Since the Electricity Supply Bill was introduced into the House of Commons, the local authorities on the North-East Coast have agitated for its amendment in several important particulars. Newcastle City Council requested its Parliamentary Committee to consider the Bill, and submit a report on the subject. On May 29 the report was brought before the City Council, and was approved. Subjoined is the whole report :—

1. The Parliamentary Committee have had under consideration the Electricity (Supply) Bill.

2. The Bill, which is largely based upon the recommendations contained in certain reports upon the subject of electricity supply which during 1917 and 1918 were made to the Government, proposes the establishment of a Board of Electricity Commissioners acting under the Board of Trade who are to divide the country into electricity districts, for each of which is to be appointed a District Electricity Board consisting of representatives of (*a*) local authorities, companies, and persons who are already supplying electricity ; (*b*) large consumers of electricity ; (*c*) labour ; and (*d*) Councils (including County, Borough, and District Councils), who are not themselves supplying electricity, but who agree to afford financial assistance to the board.

3. To these boards are to be transferred all existing generating stations and main transmission lines at a price which represents (broadly speaking) for municipalities an indemnity against outstanding charges for sinking fund and interest and for companies the cost of land, buildings, and plant (less depreciation).

4. When established it will be the duty of the board to provide or secure the provision of a cheap and abundant supply of electricity within their districts ; and they may, instead of operating directly, lease their undertakings to existing companies or establish new companies to carry out their duties.

5. The rights of purchase by local authorities of electric lighting undertakings in their areas under the Electric Lighting Acts will be abrogated, and will be transferred to the District Boards.

6. The District Boards' prices are to be sufficient to cover their expenditure on income account (including interest and sinking fund charges), with such margin as the Electricity Commissioners may allow; and the boards are also to supply electricity to any generating station which may be transferred at a price not greater than that at which the former owners could have generated it.

7. On the establishment of the Ministry of Ways and Communications, the powers of the Board of Trade respecting electricity are to be transferred to the Minister of Ways and Communications.

8. The whole question of electric power supply in Northumberland and Durham and the Cleveland area of Yorkshire has been under the consideration of a conference of local authorities since April, 1918, and, prior to the introduction of the Bill, a reasoned statement to which, with two exceptions, the interested authorities were parties, was submitted to the President of the Board of Trade, (Sir A. Stanley) and the Minister of Reconstruction (Dr. Addison) setting out in detail the views of the conference.

9. The Bill, in addition to creating new local electrical authorities separate from and independent of the municipalities and other local authorities, is so drafted that if passed into law in its present form the District Board for this area might well be so constituted that the interests of existing electrical undertakings operated for individual profit would have an undue ascendancy, and the influence and control of representatives of the municipalities and other local authorities be negligible and ineffective. In this way the principle of local public control of electricity supply would be obviated, and the virtual monopolies of the electric power companies who have in the past been able to extend their activities in districts from which the municipalities have been debarred would be consolidated and strengthened.

10. Without dealing in detail with the provisions of the Bill, the Committee recommend the adoption by the Council of resolutions in following terms :—

(1) That the necessary measure of local public control upon the District Electricity Boards can only be secured, and public confidence in such Boards be engendered and maintained, either by the complete elimination from such boards of representatives of commercially-owned electrical enterprises, or, alternatively, by provision being included in the Bill securing that the number of representatives of local authorities upon any District Board shall be such as to give such representatives a clear majority of the whole number of the board.

(2) That the "standard price" proposed for generating stations of local authorities transferred to District Boards will operate unfairly as between local authorities and companies, and is also inequitable and unjust, being to the detriment of those local authorities who have carried on their undertakings with economy and prescience as against those whose undertakings have been improvidently conducted ; and that the terms of transfer should be the same both as regards company-owned undertakings and those of local authorities, viz., the cost of land, buildings, and plant, less depreciation.

(3) That the provisions of the Bill which enable District Boards to operate through companies who are authorised undertakers and through companies specially constituted for the purpose, and also to lease their undertakings to companies, are open to strong objection as being contrary to the principles upon which a national supply of a commodity of public utility should proceed, and as tending to consolidate and strengthen the monopolies of electricity undertakings operated for private profit.

(4) That express provision should be inserted in the Bill enunciating the principle that District Electricity Boards shall supply electricity at the actual cost of generation and transmission together with a margin for contingencies to be fixed by the Board of Trade ; and that as regards the supply of electricity to the owners of a generating station or main transmission line transferred to the board the cost at which the owner could have generated it or the cost to the board, whichever be the smaller, shall be the price to such owners.

(5) That it be obligatory upon District Electricity Boards to publish annual reports, statements, and accounts in a form to be prescribed from time to time by the Board of Trade containing such particulars as may disclose a full, fair, and accurate statement of affairs, including scales of charges and particulars of special contracts entered into, such accounts and particulars to be delivered to the Clerks of Local Authorities in the boards' areas, and to be obtainable for a current year or for any year during the preceding five years by individuals on payment of a nominal fee.

(6) That the Committee be authorised to take all such steps as they may deem necessary to give publicity to the views of the Council, and to bring them to the notice of Members of the Houses of Parliament.

Dated this 27th day of May, 1919. GEORGE LUNN, Chairman.

THE TECHNICAL INSPECTION ASSOCIATION.

Owing to war demands the number of the military staff at the Woolwich Inspection Department became quite inadequate, so the services of civilians had to be called upon. These came from all parts of the world, and were chosen for their engineering, scientific, and technical knowledge. The total number of men so employed grew to 1,500, and formed a corps of zealous specialists. Some educated women also came forward to assist. At the end of the war a scheme was started to enable the members of the department to keep touch with one another after their dispersal, and to continue an organisation for that purpose by adding to their number.

A provisional committee was formed in January, 1919, after a meeting held in London on December 19, 1918. At a subsequent meeting in March the present Council was elected, and the inaugural meeting of the Technical Inspection Association was held in two of the minor halls of the Wesleyan Central Building on the evening of May 9, 1919. The president, Mr. A. H. Collins, C.B.E., M.Inst.C.E., was in the chair, supported by the vice, Mr. A. E. Hedley, C.B.E., and several members of Council. One of these, Lieut.-General Sir Percy Lake, K.C.B., K.C.M.G., and the hon. secretary, Mr. W. Haynes Smith, devoted much time and trouble to the preparation, the result being a most successful evening.

The president, after serving on the Great Northern, Great Central, Buenos Aires Great Southern, and as chief engineer on the Shanghai-Hankin railways, was appointed Controller of the Government Inspection Department. In his address on this occasion he made full use of his technical knowledge and experience, and deeply impressed on his hearers the advantage, indeed, the necessity, of close inspection by technical experts in all manufactures both in peace and in war time ; especially so as regards chemical research, without which the mechanical tests, however carefully done, would be of comparatively slight value.

Mr. Collins struck what we think is a new note when he pointed out that a thoroughly experienced inspection officer could, by bringing his knowledge to bear at the design stage, assist in the competitive race for commerce with which our factories are now faced. This he would do by ensuring simplicity, and therefore ease of inspection in any manufactured article. The president is convinced that the members of the association will become recognised as specialists whose work and judgment would be accepted without question, and that in the development, progress, and success of British industry the efforts of the members will become a material if not an indispensable factor.

Cinematograph views were given at intervals of inspection work ; refreshments were served in the adjoining hall to the strains of the excellent string band of the Royal Horse Artillery, and the aisles of the lecture hall were lined with exhibits of the results of inspection or of the tools and appliances used in the work. A large proportion of the 500 members enrolled, with a number of their friends, were present, including many ladies, and everyone thoroughly enjoyed themselves. The present address of the association is Hotel Metropole, Northumberland Avenue, S.W.1.

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MINISTRY OF WAYS AND COMMUNICATIONS BILL.

PROCEEDINGS IN STANDING COMMITTEE FROM MAY 6 TO MAY 28.

At the resumed sittings of the Standing Committee on the Ministry of Ways and Communications Bill, on Tuesday, May 6, Clause 3 (power to control temporarily railways, etc.), with amendments, was recapitulated. As it then stood, Clause 3 provided that (1) the following provisions shall have effect for two years after the passing of the Act: (*a*) the powers hitherto exercised by the Board of Trade over transport undertakings shall be transferred to the Minister; (*b*) the Minister may take possession of railways, light railways, tramways, canals, docks, etc.; (*c*) the directors and plant of transferred undertakings shall be wholly under the control of the Minister, and shall obey him as to (i.) rates and fares to be charged, (ii.) salaries and wages to be paid, (iii.) working and discontinuance of the undertaking, (iv.) design and equipment of plant and appliances, (v.) alterations and improvements, (vi.) co-operation between undertakings, (vii.) facilities for exchange of running powers, (viii.) manufacturing and repairing facilities, and (ix.) preparation of accounts, statistics, returns, etc.; (*d*) the Minister may authorise acquisition of lands, construction of works; (*e*) any fares, rates, etc., directed by the Minister may be charged, notwithstanding statutory limitations. (2) There shall be transferred to the Minister any officer or servant of an undertaking of which possession is taken, but no officer or servant shall be in any worse position as regards salary, etc., than he would have been had his services not been transferred. (3) Section 20 of the Local Government (Emergency Provisions) Act, 1916, which relates to the establishment of new routes for omnibuses, shall continue in force until the expiration of two years after the passing of this Act. (4) Where by reason of the exercise of the powers under this section, the value of any undertaking has been depreciated or enhanced, the owners of the undertaking shall be entitled to be recouped or liable to pay the amount by which the value has been depreciated or enhanced. (5) The provisions of the Railway and Canal Traffic Act, 1888, as amended by subsequent enactment, shall apply to the determination of questions arising under the Act.

The Committee agreed, without discussion, to an addition to Clause 3, proposed by Sir Eric Geddes, setting up an advisory committee to assist the Minister of Transport in giving directions as to rates and charges.

Mr. Joynson-Hicks moved an amendment to Section 3, the effect of which is to provide that the existing powers of highway authorities in regard to omnibuses shall remain unimpaired, but that "where upon application for a licence to ply for hire with an omnibus the licensing authority either refuses to grant a licence or grants a licence subject to conditions, in either case the applicant shall have a right of appeal to the Minister from the decision of the licensing authority, and the Minister shall have power to make such order thereon as he may think fit, and such order shall be binding on the licensing authority."

This important amendment was discussed at length, and its application was defined by Col. Sir Rhys Williams as follows:—"The highway authority will still have the same power of objecting to omnibuses running on routes as they have now under the emergency powers, but the appeal which the omnibus companies have at present against the refusal by the highway authority they will still have, only that appeal will come to the Ministry of Ways and Communications instead of to the Local Government Board. To meet a conceivable position—where a local authority has refused to allow an omnibus company to run on a certain route, and that company has appealed to the Minister of Ways and Communications successfully, it is possible for the highway authority then to put such conditions—if it is the licensing authority for vehicles—on the licence that the company could not run them. As the law stands at present, the omnibus company has no appeal against any conditions which they may think arbitrary or unfair. This amendment gives them an appeal against any conditions which they think are arbitrary on the licensing of vehicles, so that the omnibus companies will be in a better position after this." The amendment was agreed to.

An addition to Clause 3 was moved by Mr. Shortt, safeguarding the right of local authorities to purchase tramways or light railways used as tramways. The amendment was accepted.

Sir William Raeburn moved an amendment requiring that the Minister take over the whole of any harbour or dock undertaking, part of which he desired to acquire. The Home Secretary, Mr. Shortt, replied that the Government could not entertain such a proposal, and the amendment was rejected.

Clause 4 (power to acquire railways and other undertakings) was, on the motion of the Home Secretary, eliminated from the Bill.

Clause 5 (power to make advances for certain purposes).—(1) The Minister may, subject to the approval of the Treasury, make advances out of moneys provided by Parliament, to any authority, company, or person, either by way of grant or loan, for the purpose of constructing railways, tramways, roads, bridges, ferries, harbours, etc., and maintenances of these. Sir Frederick Banbury proposed an amendment to prevent public aids being used for the purpose of competing against companies. Sir Eric Geddes pointed to the fact that, under another section of the Bill, companies or undertakings would have the option of taking up any service in which they were engaged before the Minister took steps to establish it. On this understanding the amendment was withdrawn. Upon this clause also Mr. Joynson-Hicks drew from the Government the admission that all roads would be classified under the superintendence of General Maybury. Clause 5, as amended, was ordered to stand as part of the Bill.

Afterwards Clause 6 (power to require statistics and returns) came under discussion. A proposal was made to exclude owners of private streets and roads from the undertakings called upon to furnish such accounts and statistics as the Minister might require. The amendment was rejected, and the Committee adjourned.

At the next sitting on Wednesday, May 7, Clause 6 was amended by the addition of the words "provided that the Minister shall be liable to repay to such owners any extra cost involved in the preparation of such accounts, statistics, and returns." But the opposition to the clause seemed likely to be prolonged, and the Home Secretary asked leave to withdraw it, undertaking to produce a new clause on report. On this understanding the clause was withdrawn.

Clause 7 (power to hold inquiries) provides that the Minister may hold such inquiries as he considers necessary for the purposes of the Act. With a small technical amendment, the clause was passed.

Clause 8 (staff and remuneration) deals with the appointment and remuneration of the staff required by the Ministry. Reference having been made to the possibilities of jobbery in such a service, the Government undertook to consider the question whether it would be possible to arrange that appointments should be made by an authority independent of political pressure.

On Clause 9 (seal, style, and acts of Minister) two small amendments were made. The first was insertion of a paragraph making the Minister responsible for the acts and defaults of his officers and servants, and "liable to pay costs in like manner as a private person." The second amendment was designed to enable the Minister to acquire and hold lands in trust.

The rule that Ministers, on accepting an office of profit, should stand for re-election, was obviously not intended to apply to members of Government appointed for their technical qualifications rather than party opinions. By Clause 10 (ability of Ministers and secretaries to sit in Parliament) the rule is abrogated, Section 2 providing that the Minister first appointed shall not vacate his seat in Parliament for that reason. Sir F. Banbury moved that the section be deleted, but the Committee almost unanimously agreed to the whole clause.

In the definition of the Bill by Clause 11 (short title and interpretation), and sub-sections, Sir Eric Geddes proposed an amendment which would include a "trackless trolley system" and "any service ancillary to the principal business of the undertaking," so that the powers taken might be complete. The amendment was accepted.

On Tuesday, May 13, a crucial issue was raised. A new clause relating to the provisions of the Railway and Canal Traffic Act, which, as Sir Eric Geddes said, was only machinery, was accepted by the Committee. It was upon the new clause defining the constitution and powers of the advisory committees which it was proposed to set up that the contest between the Government and the determined critics of the Bill was waged. It must be said that the framing of the clause was provocative, and its terms amounted to a challenge inviting the opposition to do their worst. The clause gives the Minister powers to appoint advisory committees, but neither imposes upon him the duty of appointing nor the obligation to accept the advices of such committees. Mr. Joynson-Hicks took up the challenge, and moved an amendment providing that an independent Committee, consisting of nine persons, be appointed, and that before exercising certain powers of directing the establishment of transport services, the Minister shall refer the matter to the Committee for their advice, and they shall report thereon to him. Concluding his speech in support of the amendment, Mr. Joynson-Hicks said:—"I suggest that we should be failing in our duty if we did not try to establish some committee of this sort, not to control the right hon. gentleman, but at least to make sure before he does one of these acts, which cannot be undone once done, that he should at least go before a committee and convince them that he is right, and if he does not convince them, if they make an unanimous report that his proposal was an improper one, then my right hon. friend might drop it, and say that he would not think of attempting to carry it out." Replying on behalf of the Government, Mr. Shortt pointed out that the proposed amendment would destroy the Bill. He contended that the compensation clauses amply protected any interests which might be affected, and that as the effect of the clause giving the Minister power to take possession of undertakings was limited to two years, the checks upon his action were sufficient. "Therefore," he argued, "I ask the Committee to say this amendment is totally unnecessary. It is contrary to the general principle and the whole basis of the Bill, therefore we cannot accept it. With regard

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to the advisory committees which my right hon. friend proposes, supposing it were a labour question which was raised, he could ask trade unions to give him a committee consisting entirely of trade unionists. If it were a question of docks, he could get a committee consisting entirely of dock people. If it is a general matter affecting railways, roads and docks jointly, he could have a joint committee. He can have a committee exactly as he wants it, and that committee can give him all the advice that is necessary. I am sure that my hon. friends who have moved and seconded the amendment do not wish this Committee to treat the Minister as if he were some great malevolent influence out for the purpose of ruining the country. Therefore as compensation is provided, and it is admitted that the Minister is out to do the best he can for the country, and that you have a proper provision for compensation to any undertaking that is taken over if any harm is done to it, the need for these checks and safeguards is entirely gone, and I ask the Committee to reject the amendment."

At the end of a long day's discussion, the Committee rejected first the amendment of Mr. Joynson-Hicks, and then the new clause proposed by Sir Eric Geddes. In this position the Committee adjourned.

On Wednesday, May 14, after deciding to adjourn at 1 p.m., to allow members to attend the second reading of the Electricity Supply Bill, in the House of Commons, the Committee gave consideration to a new clause on advisory committees, submitted by Sir Eric Geddes, and an amendment proposed by Mr. Neville Chamberlain. Both proposals were rejected, and a rather difficult situation was created thereby. In order that the matter might be settled, the Government was requested to submit another clause, and Mr. Shortt moved that (1) a panel be set up, consisting of experts representing the various classes of undertakings affected, as also labour, trading interests, local authorities, and such other interests as the Minister shall deem desirable; and (2) to require the Minister to refer to a committee selected from this panel any questions which he may consider of sufficient importance affecting the establishment of new transport service by land or water. The clause was accepted.

Amendments to the new clause setting up a panel from which advisory committees would be selected were proposed and debated on Thursday, May 15, the chief effect being to remove from the Minister the option of referring any matter to an advisory committee, and to give power to the undertakings and interests affected the right to object and appeal.

An important new clause was brought forward on Tuesday, May 20, by Sir Eric Geddes, making provisions relating to officers or servants of any undertaking, of which possession may be taken or retained under the Act. For the purposes of this clause, the Lord Chancellor shall appoint a standing arbitrator or board of arbitrators, who shall consider questions as to whether any officer or servant has suffered injury or loss by any change made by the Minister, and award such sum as they deem sufficient to compensate for the loss or injury. Amendments to the clause were moved, but the clause was passed substantially as proposed by the Minister.

Discussion on Wednesday, May 21, centred largely on subsidiary questions and matters of detail. Proposals to make special provisions in regard to the Port of London, and to invest the actual management of undertakings controlled by the Ministry in a Board of Commissioners, six in number, three to be representative of labour, were rejected. Mr. J. D. Gilbert moved a new clause as follows:—"The Minister shall have the power to grant permission for through runnings on adjoining tramways belonging to different owners, whether local authorities or not, and in default of agreement between such owners to settle the terms of such through running, after hearing the said owners, in such manner as he thinks fit." Sir Eric Geddes accepted the amendment, substituting the word "require" for "grant permission," so that, as he said, he might have some power of initiation. The clause was agreed to.

The Home Secretary, on Thursday, May 22, moved the second reading of a proposed new clause designed to deal with claims made against and by the Minister of Transport in respect of the exercise of his powers under the Act. In introducing the new clause, Mr. Shortt said:—"This is a clause which is intended to secure that there should be absolute fairness of dealing between the Ministry and any undertaking which is affected by the exercise of his powers by the Minister under the Act. . . . The clause not only provides for the payment of compensation to an undertaking which is depreciated, but it also provides for the payment by an undertaking of enhancement of the value. If the Ministry expends money upon an undertaking, and it results in the enhanced value of that undertaking, then the undertaking will be liable to pay the Ministry the equivalent of compensation if there had been, instead of enhancement, depreciation in value. It is proposed that the value shall be based upon the revenue-earning basis." Two provisos were attached to the clause. The first provided that "no claim in respect of any loss alleged to be due to any direction issued by the Minister shall be entertained, if the direction was issued with the concurrence of the owners of the undertaking." By the second proviso it is agreed that "if the Minister has done something which has enhanced the value of the undertaking, and the undertaking is about to be purchased by the State and valued by the tribunal, they are not as of right to claim the value of the improvements carried out by the Minister." On the motion of Mr. Neal, the Committee inserted in the clause words providing that, in ascertaining reduction or enhancement of value, the tribunal should take into account "the natural growth of traffic on any railway belonging to a company which, prior to possession being so taken, had not paid a dividend of 4 per cent. on its ordinary capital." As amended, the clause was added to the Bill.

Strong opposition was offered by members of the Committee on Tuesday, May 27, to the new clause relating to the provision of powers for the purchase of privately-owned wagons. Mr. Shortt said the clause provided that the Minister might purchase privately-owned wagons for use on the railways, and in order that no individual trader might be prejudiced in relation to other traders, if any wagons were taken all must be taken. Provision was also made for the fixing of charges for the use of wagons, and for dealing with demurrage. The clause was absolutely essential for the purpose of pooling rolling stock. Severe criticisms were made upon the clause by members of the Committee. Replying to objections raised, Mr. Shortt pointed to the fact that, during the war, the pooling of wagons had resulted in a saving of nearly £3,000,000 per annum in shunting alone. The total saving by pooling had amounted to something like 34 per cent. On the chairman intimating that he could not take another clause dealing with the same subject, the clause was agreed to.

At the final sitting of the Committee, on Wednesday, May 28, several amendments to the wagons-purchase clause were proposed. Mr. Nelson sought to protect the interests of wagon repairers, and moved that words be inserted providing that, when wagons were purchased by the Minister, any contracts for repairing those wagons should be adjusted by agreement. Mr. Shortt undertook, before the report stage, to draft a form of words which might meet the case.

A new clause giving power to discharge capital liabilities under the Act by the issue of stock, and providing that the Treasury may create and issue securities for that purpose, was agreed to, with minor modifications to be embodied in another draft of the whole clause.

Sir William Raeburn moved the addition of a new clause, providing that in the event of an authority or person claiming that any direction of the Minister was unreasonable, appeal may be made to the Railway and Canal Commission, who may cancel the direction. Mr. Shortt opposed the clause, and it was negatived. Thanks to the Chairman of the Committee, Mr. William Brace, concluded the proceedings.

The measure will come up for third reading in the House of Commons after the Whitsuntide recess.

CONTRACT FARES AT BLACKPOOL.

Seldom has the raising of tramway fares caused such a ferment among the people affected as the proposed increase in the charge for contract tickets made by Blackpool Corporation. Curiously enough, there are few increases in tramway fares more evidently justifiable, so far as an outsider can judge. It appears that, early in the history of Blackpool Corporation Tramways, a system of yearly contract tickets was instituted, whereby anyone might travel over any part of the tramways system for the sum of £3 per annum. The measure was well-advised, for, on the one hand, it encouraged people to make their homes near the tramway line outside the town, and on the other hand the tramway system was small and in need of traffic. Now, however, the mileage of the Blackpool tramways is vastly increased, the cars are congested, and passengers who pay ordinary fares are charged out of all proportion to the amount paid by the holders of contract tickets. Anyone buying a contract ticket can travel for, say, about twopence a day, distances which cost ordinary passengers at least three times as much. Some alteration in that state of matters has long been overdue. It may be that the raising of the price of the contract ticket from £3 to £8 is just a little too sudden, and the outcry of the contract ticket holders is quite natural. Meetings have been held by the ticket holders and their friends, protesting against what they regard as an outrage. To obviate grievance, Blackpool Corporation Tramways Committee instructed Mr. Furness, the general manager of the tramways, to draw up a scheme for contract tickets. The scheme, which provides for contract tickets graded from £4 to £8 per annum for adults and £2 10s. for juveniles, according to distance, has been approved by the committee.

Track Repair Required at Salford.—At a meeting of Salford Town Council, Alderman Linsley, chairman of the Tramways Committee, alluding to the contribution from the tramways of £25,000 toward the rates, said that 30 miles of their 60 miles of track were in a very bad condition, and if the Corporation insisted on taking any large sum from the Tramways Committee fund, the committee would have no alternative but to ask for a contribution from the rates for repairs.

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TRAINING OF MOTORMEN, CONDUCTORS AND INSPECTORS.*

By M. Karl Rothy,
Chief Inspector of the Budapest Tramways.

All tramway undertakings are bound to give careful attention to the selection and training of their motormen, conductors, and inspectors. It is a matter of the first importance that every such service should have at its disposal a thoroughly trained and disciplined staff to which its rolling stock may be entrusted without fear of accidents or uneconomical working. A motorman who has undergone a satisfactory course of instruction in all branches of his duty, and who pays attention to all rules drawn up for the furtherance of public safety, can not only avoid many accidents, collisions, and interruptions of the service, but can also drive his vehicle in such a way as to minimise wear and current consumption, two very important factors in the costs of the undertaking. Moreover, by due observance of the timetable and his position with regard to other cars, he will materially increase the regularity of service. A trained conductor is able to assist the financial side of the undertaking even more directly by ensuring that all passengers pay the correct fare. He has also to secure within his own sphere the observance of all regulations relating to public safety, good order, hygiene, etc.; in this connection he must be both tactful and firm, so as to obtain compliance with the regulations without giving offence to passengers.

In spite of the fundamental importance of a thorough training of the *personnel*, there is another part of the question to be considered. It cannot be said that all the difficulties occurring in the course of the service are by any means due to ignorance, though many outsiders, and sometimes even persons connected with management, would lead one to believe that the one universal trouble was lack of sufficient training. The real cause will often be found to lie in the non-compliance by the *personnel* with regulations of which they are perfectly well aware. It is this which brings us to the necessity of establishing a permanent system of control, and requires the selection and efficient training of an inspecting staff.

We will consider the instruction given to car crews on various undertakings from whom replies have been received. The total number, one hundred, was purely due to chance, but is of convenience in drawing percentages. I must point out, however, that this does not help much, since that number includes a great variety of systems under very different working conditions. For instance, a motorman on a small system will clearly not need the same time to learn the manipulation of one standard type of car as a *confrère* who may be called upon to handle a number of different cars. Again, the existence of overhead cables or conduits, unguarded junctions or lamp signalling, all have their say in the period required. Similarly a conductor on a small system with a simple tariff scheme will learn his duty much more rapidly than his counterpart in a city where considerable knowledge of routes, transfers, etc., may have to be acquired. Yet another factor is the class of man available; where the average run of recruits are of a higher standard of intelligence the course can be made correspondingly shorter. The relative periods required for drivers and conductors on various undertakings are as follows:—

Motormen.		Conductors.	
On 5 systems	Up to 8 days.	On 8 systems	From 3 to 5 days.
On 5 "	From 5 to 10 days.	On 19 "	" 5 to 8 "
On 24 "	" 10 to 15 "	On 14 "	" 8 to 10 "
On 22 "	" 2 to 3 weeks.	On 19 "	" 10 to 15 "
On 17 "	" 3 to 4 "	On 17 "	" 2 to 3 weeks.
On 8 "	" 4 to 5 "	On 10 "	" 3 to 4 "
On 6 "	" 5 to 6 "	On 7 "	More than 4 "
On 12 "	More than 6 "	On 2 "	Undeterminate.
On 1 system	Undeterminate.	On four systems there are no conductors employed.	

Thirteen undertakings require their *personnel* to go through courses of instruction in both branches of the service, and it is clear that in such cases the necessary period will be at least as long as that required for the simple motorman's course, and probably longer. In thirteen cases motormen are only selected from among the existing conductors, while in fifteen every conductor is required in the first place to perform the duties of motorman for a given period. In those cases where instruction is given in both branches the man is employed in either capacity. There can be no doubt that great advantages attach to this system, but on many of the larger tramways, where complete instruction for all would prove too costly, only that proportion of the staff are given the dual training which will provide a reserve sufficient to compensate for fluctuation in the strength of the two branches, and enable measures to be taken to deal with particularly heavy traffic on special occasions.

At Mannheim and Neuchatel the classes are held in the evening, and in the latter case the company allows the men to continue their former occupation during the day time.

Much necessarily depends upon the use to which these instructional periods are put. If the pupils are continually under the instructor's eye and individual attention is given, it is clear that much more rapid progress will be made than by constant reiteration of formulæ or by merely putting into the beginner's hands a collection of rules and regulations which he is expected to learn first, and then endeavour to understand. From another point of view, more rapid acquisition is often obtained by making it the pupil's interest to become efficient as quickly as possible by study and attention; moreover, such an arrangement has the additional advantage that in the event of failure the institution is not required to defray the entire cost.

In arranging schemes it is necessary to consider, on the one hand, whether wages should be paid during instruction, and on the other what method should be adopted for deterring employees who may wish to leave the service of the undertaking so soon as they have profited by the course, or even before its conclusion. The simplest method is in vogue on the tramways of Aix-la-Chapelle, Algiers, Astrakan, Basle, Bordeaux, Breslau, Brussels, Cairo, Elberfeld, Fribourg, Geneva, Ghent, Le Havre, Christiania, Liège (2), London, Lyons, Madrid, Magdeburg, Mannheim, Marseilles, Neuchatel, Neustadt, and Paris. In these cases no wages are paid until the men are proficient. By other authorities learners are paid a reduced wage during training, and these include Amsterdam, Barmen, Berlin, Budapest, Crefeld, Crernowitz, Darmstadt, Dortmund, Dresden, Genoa, Gerthe, The Hague, Heidelberg, Linz, London, Lucerne, Munich, Nuremberg, Paris, Kattowitz, Hamburg, Tientsin, Bonn, Hagen, and Petrograd. At Christiania, Erfurt, and Mulheim certain reductions are made from wages, while Dusseldorf, Lubeck, Mansfield, Saint-Gall, and Schlieren only commence payment after a certain stage in the course has been reached. In all other cases full salary is paid to pupils.

In view of the high costs of training, in which wages, wear of uniform, administrative expenses, provision of learner's apparatus, practice vehicles, etc., must all be included, it is of great importance that only those who can be relied on to render useful service at the end of the course should be admitted. This aim, however, is not easily realised, and certain undertakings have been obliged to take measures to prevent men whom they have wholly or partially trained from abandoning their service until they have made some effective return. The arrangement of twenty-four undertakings are as follows:—Bremen, Darmstadt, Hagen and Rostock, Mulhaus, and Saint-Gall all require a minimum period of service of three weeks; Dresden, four weeks; Chemnitz, six weeks; Brandenburg, Budapest, Dortmund, Kattowitz, Limmathal-Schlieren, Strassburg, six months; Mannheim, seven months; Dortmund (electric), nine months; Berlin, Crefeld, Düsseldorf, Leipzig, Christiania, and Waldenburg, twelve months; Budapest (electric), thirteen months. In these cases, if an employee should desire to leave before the expiration of his engagement period, or should be dismissed the service for some serious misdemeanour, he is liable to forfeit in whole or in part the money which was paid to him during his learner's period. On a few of these systems it is customary to withhold a portion of such wages until the completion of the obligatory period. All these arrangements, it will be observed, are really exceptions to the general practice, but they achieve their object of excluding from the instructional classes all except those who intend to take up the work seriously.

From the various replies that have been received, it appears that almost all undertakings conform to certain general principles in the course of instruction, though as we have already indicated the details and the length of time required necessarily vary with the size of the system, and the diversity of its technical appliances. In the larger undertakings, where there are always a certain number of men under instruction, definite classes are formed, and a regular timetable drawn up. The learner motorman is first taken to the car depot, where he is shown the equipment of the cars, the use of the controller, of the electric conductors, of the brakes, etc. After the first demonstration he is required to practise all the movements on a car without current. From the first the importance of starting gradually is insisted upon, and the pupil is taught to remember the correct time interval for each notch (two seconds) by counting aloud two numbers such as 21-22 with several syllables. After that he is taken out on special learners' cars, or possibly ordinary cars that are not in use, and allowed trials under the immediate supervision of the instructor. Needless to say this takes place where possible on an unused section, so that as progress is made minor defects or stoppages can be brought about to give the pupil instruction in the methods of dealing with them. Theoretical instruction is carried on jointly with the practical, so that the learner is taught the rules of the road, regulations for the use of signals, and the rendering of reports, as well as the rights of priority in passing and in the use of single line sections. Both in theory and in practice the question of safety receives the most careful attention, and all means for preventing accidents and collisions are thoroughly dealt with, special measures being taken to test the coolness and presence of mind of the pupil. An interesting detail is the method employed by M. Zsarko, chief inspector in charge of instruction, who arranges to have life-sized dummies thrown in front of cars moving at high speed. This gives the pupil an opportunity to display his quickness, while impressing upon him the necessity of being always on the look-out, and prepared to stop

* A Paper prepared for the International Tramways Congress, 1914, and recently issued by the Permanent International Tramways Union.

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the car in the shortest possible time. To give the candidate practice in halting at the exact spot desired, white discs are unexpectedly put up at different points on the route, and on perceiving these the pupil must stop the car immediately in front of them. These devices for safety instruction have been in use on our system for over two years, and have undoubtedly resulted in better and more careful driving.

At the same time pupils will be taught the great importance of driving the car in as economical a manner as possible, not only as regards current consumption, but also from the point of view of reducing wear in controller, brakes, etc. As far as possible clear explanations are given and devices employed for demonstrating and impressing this important matter on the pupils' minds. Fifty-five systems use some form of meter to show how much current is being consumed, while the remainder are content with explanation. At any rate, it is evident that the use of meters, if only on the instructional cars, is desirable.

The question of offering bonuses to economical drivers does not fall strictly within the subject of this paper, but it is so closely connected with the completion of their training and with the inspecting department that it cannot be altogether omitted. It has already been the subject of numerous papers, and it is unlikely that universal agreement will be found for some time to come. The plan has been adopted upon the 21 lines mentioned here :—Algiers, Bordeaux, Budapest (2), The Hague, Hamburg, Linz, Liége, Madrid, Magdeburg, Marseilles, Moscow, Mulhouse, Paris (3), Rostock, Vienna (2), Wurzburg. At Stockholm and Warsaw the authorities publish at regular intervals the names of those motormen who have shown satisfactory results, as a means of encouraging all to greater effort. There are two distinct principles upon which the award of bonuses has been based. In some cases the economy is reckoned solely from the readings given by meters on the cars, while the remainder take into account general good service, observance of traffic regulations, avoiding of accidents, and the maintenance of good order and discipline.

Exactly similar principles are applicable to the instruction of pupil-conductors. The theoretical portion of their course includes traffic regulations, the geography of the routes, correct handling of the tickets, demeanour towards passengers, and the method of keeping count of fares. The practical portion of their course usally takes place on working cars under a trained, capable, and trustworthy conductor. On the technical side those who are being trained as conductors only will have to learn nothing but the most essential operations, such as opening the emergency switch and applying the brakes (in case anything should make it impossible for the motorman to stop the car), making fast or releasing a trailer, removing a damaged trolley, working the points, etc. On joining the Budapest tramways, a prospective conductor is given a schedule of the seventeen days' course he is to undergo, and this is found of considerable assistance to both pupil and instructor. I do not hesitate to recommend the system to any large undertaking which may not have adopted it as yet. The last paragraph requires the pupil to draw up a daily report during his instruction showing what he has done ; this is to be initialled by his instructor. The report provides an excellent means of judging the general intelligence and degree of education of the student when the examination comes round.

Where classes are large, examination dates are fixed beforehand, and these are only held on the conclusion of each course. On smaller undertakings it is often possible to recognise superior ability, and vary the period of instruction accordingly ; in such cases the time of examination is adjusted as desired. The final examination, which is not related to any preliminary tests that the instructors may have given their own pupils, is arranged by some higher official of the undertaking (director, chief engineer, chief inspector, etc.), who is responsible not only to his administration, but also to the public authorities. A representative of such authorities attends all final examinations, the status of the individual being defined in the following cases :—Hamburg, police official ; Marseilles, Tramways Inspection Board ; Munich, a member of the "Revisionverein" ; Nuremberg, Paris, and Stockholm, police officials ; Strassburg, Mining Board ; Petrograd, Government railway official. In addition to these the examinations at Berlin are liable to be visited without notice by a railway official, those at Budapest by the Railways and Waterways Inspecting Board. Fifty-three of the undertakings give their conductors driving permits on passing the examination, while the remainder are content to enter the fact in a special file or in the men's individual records. The majority allow the drivers to start regular work so soon as they have passed the test, confining them as far as possible to quiet routes at first ; fourteen give them a further week on a car in charge of an experienced driver. The conductors start duty on their own at once, but are carefully watched by inspectors for the first few days.

The training of inspectors is a simpler matter, for in nearly every case they are chosen from the ranks of the existing *personnel*. Tried men of considerable experience, normally something over ten years, are selected if they show the requisite intelligence and tact, and are thoroughly acquainted with conditions in both branches of the service. This latter qualification is practically beyond the reach of an outsider, and so he is altogether excluded from the ranks of uniformed inspectors. A few days' training is usually sufficient for those who have served their time in the other branches. This system has the advantage of holding out an opportunity to the employees of improving their position by loyal and zealous service ; on the other hand, it cannot prevent a continued intimacy between the inspector and those under him which may lead to undue leniency. To overcome this difficulty, and to deal with any unauthorised practices that might be concealed from uniformed inspectors, the tramways at Aix-la-Chapelle, Amsterdam, Astrakhan, Berlin, Budapest (2 lines), Cairo, Christiania (2), Cernowitz, Paris (2), Petrograd, and Stockholm employ plain clothes inspectors. These are unknown to the general staff, and even to the other inspectors, so that by travelling with ordinary tickets they are able to see all that takes place without their presence being suspected. The observations of these men give the authorities information of facts of which they might otherwise be unaware, and often enable them to take action before serious troubles arise. At the same time the employees, knowing themselves to be under observation, are much less likely to engage in undesirable practices. We are glad to say that the inspectors' reports are not by any means entirely devoted to censures, but that they very often include incidents reflecting credit upon the men. In our case, and doubtless in others also, such occasions are made the opportunity of expressing satisfaction, or if the occasion warrants it of bestowing a reward on those concerned. From another point of view, these inspectors will sometimes discover incorrect behaviour on the part of passengers, and for such occasions we provide them with written authority which they can produce if necessary. There can be no question of the importance of carefully selecting and training men destined for this work, as their reports can be of no value unless absolutely trustworthy. They have to understand that it is not at all to their interest to bring up numerous cases, but only that all reports shall be strictly accurate ; any misstatement or even a simple mistake rendering them liable to instant dismissal. They are also directly forbidden to provoke employees with the object of reporting their conduct. The majority of the undertakings that have made use of such plain clothes inspectors declare themselves quite satisfied with the results.

I am aware that the foregoing summary is far from exhausting all the details of the conscientious replies received to the forty-eight questions, and am sure that anyone wishing to go more carefully into one or more questions of detail will find therein much interesting data.

LONDON UNITED TRAMWAYS COMPANY.

At the annual general meeting of the London United Tramways Company Limited, the chairman, Mr. W. M. Acworth, said the gross receipts of the undertaking for 1918 were £362,426, and the expenses were £373,831, making a loss of £11,404. Adding debenture and loan interest and the losses on the previous two years, the deficiency amounted to £94,050. The directors attributed the increase in working expenses to advances in costs of labour and materials. Their wages bill was 60 per cent. above what they paid for labour before the war, and materials had increased in cost by over 100 per cent.

In November last the Bill they had promoted in Parliament passed into law ; the negotiations with the first mortgage debenture holders for the rehabilitation of the company's finances had been brought to a successful conclusion.

By their Act of Parliament the right to purchase held by the twenty different local authorities whose areas the company's system traversed, dated at various years between 1924 and 1935, was postponed to a uniform date in 1950. In addition, the Act conferred upon the company authority to make a substantial increase upon their statutory fares.

Under the financial scheme of the Act, their total capital had been reduced by more than £1,500,000, and their debenture debts by nearly £900,000. Arrears of interest had been cancelled, and for the year 1918 the scheme provided that interest was only to be paid on the reduced amount of the debenture stock. That interest, amounting to £34,313, was duly paid on May 6. It followed that this interest was the only fixed charge they would have to meet during the next few years.

This was a very important point, as before the undertaking could recover its full earning powers, and receive the full benefit of the increased fares, a considerable amount of reconstruction work must be carried out. It was an important feature of the agreement with the debenture holders, as sanctioned by the court, that the £235,000, representing the purchase price payable by the London County Council for the Hammersmith tramways undertaking, was to be set free by the debenture holders, and placed at the company's disposal as part of the £400,000 to be devoted to purposes of reconstruction.

Mr. H. A. Vernet seconded the motion. The resolution was carried unanimously.

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LIVERPOOL CORPORATION TRAMWAY CARS.

In earlier pages of this issue are described the new cars that are just being completed for Liverpool Corporation Tramways. In addition to the cars now on order, the Corporation has 600 cars of various types, which are enumerated in the following tables, in which are given the types of motors, trucks, and the seating capacity of the respective classes :—

Single-deck American cars, with side entrance	12
American cars, fitted with upper deck, reversed staircase ...	3
Double-deck, single truck cars, with ordinary type of staircase, uncovered	21
Double-deck, single truck cars, with ordinary type of staircase and top covers	90
Double-deck, single truck cars, fitted with reversed staircase and canopy tops	449
Double-deck, single truck cars, fitted with double staircases and canopy tops	24
Double-deck, double truck car, with double staircase and canopy top	1
Total	600

Type.	Number of Cars.	Motors. Type.	Motors. H.P.	Type of Truck.	Passengers. Inside.	Passengers. Outside.	Licenced Capacity
American single deck	12	Walker ...	35	Brill .	40	—	54
American double deck	2	Walker ...	35	Brill ...	40	60	124
American ,, ,, ...	1	Walker ...	35	Brill ...	40	56	120
British Thomson-Houston double deck	12	B.T.H. ...	25	Peckham	22	28	65
Westinghouse double deck...	3	Westinghouse...	25	Peckham	22	28	65
Liverpool ,, ,, ...	6	Walker ...	25	Brill ...	20	26	61
Liverpool ,, ,, ...	3	Walker ...	25	—	22	42	73
Preston ,, ,, ...	90	Walker ...	25	Brill ...	22	30	61
Liverpool ,, ,, ...	15	Westinghouse...	35	Brill ...	22	42	73
Liverpool ,, ,, ...	53	Dick-Kerr 3 A4	35	Brill ...	22	42	73
Liverpool ,, ,, ...	3	Dick-Kerr 9 ...	35	Brill ...	20	40	73
Liverpool ,, ,, ...	2	Walker ...	25	Curtis ...	24	42	75
Preston ,, ,, ...	128	Walker ...	25	Brill ...	22	42	73
Liverpool ,, ,, ...	58	Dick-Kerr 20 ...	40	Brill ...	22	40	71
Preston ,, ,, ...	186	Dick-Kerr 20 ...	40	Brill ...	22	42	73
Liverpool ,, ,, ...	1	Siemens ...	35	Brill ...	22	40	71
Preston double deck (Twin Staircase)	1	Dick-Kerr 20 ...	40	Bogie ...	32	51	83
Preston ,, ,, (Twin Staircase)	1	Dick-Kerr 20 ...	40	Brill ...	32	40	72
Liverpool ,, ,, (Twin Staircase)	22	Dick-Kerr 20 ...	40	Brill ...	32	40	72
	1	Dick-Kerr 20 ...	40	Peckham	30	40	70

NOTE.—Sixty-eight of the above cars are operated as first-class cars, with a seating capacity of 20 inside and 38, 40, and 42 outside.

FINANCIAL REPORTS AND MEETINGS.

HALLEY'S INDUSTRIAL MOTORS.—The directors announce an interim dividend of 5 per cent. actual, less tax.

BELSIZE MOTORS.—The report announces an interim dividend on ordinary shares of 4 per cent. actual, less tax.

JOHNSON AND PHILLIPS, LIMITED.—A dividend is announced of 10 per cent. per annum on ordinary shares for 1918.

DEFICIT AT DARLINGTON.—There has been a loss on Darlington Corporation Tramways of £1,761 during the past year.

BRITISH COLUMBIA ELECTRIC RAILWAY.—An interim dividend of 2½ per cent. is announced on the deferred ordinary stock.

AUCKLAND TRAMWAYS.—A distribution is announced of 6d. per share, less tax, on account of dividend for the year ending June 30.

SIEMENS BROTHERS.—In their annual report, the directors recommend a final dividend of 5s. per share, making a total dividend for the year ended December 31 of 10 per cent., free of tax.

THE EDISON-SWAN ELECTRIC COMPANY, LIMITED.—The directors have declared an interim dividend of 3 per cent. (less income tax) in respect of old ordinary shares, for the year ending June 30, 1919.

COLNE CORPORATION TRAMWAYS show a loss for last year of £3,004. This sum was considerably larger than the estimated deficit, and the excess is attributed to the increase in wages and higher cost for energy.

CITY OF BUENOS AYRES TRAMWAYS.—The directors of the City of Buenos Ayres Tramways Company (1904) have declared a dividend of 1s. 3d. per share (being at the rate of 5 per cent. per annum), less income tax, for three months ended March 31 last.

ELECTRIC CONSTRUCTION.—For the half-year ended on March 31 the directors of the Electric Construction Company recommend a final dividend at the rate of 9 per cent. per annum on the ordinary shares, making 7½ per cent. for the year; they also recommend payment of a bonus of 2½ per cent. on the ordinary shares, less tax.

SHANGHAI ELECTRIC CONSTRUCTION COMPANY.—A dividend is announced at 5 per cent., and a bonus of 5 per cent. (making 20s. per share) less income tax on the ordinary shares, making 15 per cent. for the year. The sum of £10,000 is placed to reserve for renewals, £8,000 is written off preliminary expenses, and £19,103 is carried forward.

HADFIELDS, LIMITED.—Following on the increase of capital to £2,000,000 by the creation of 1,300,000 ordinary shares of £1 each, the directors of Hadfields, Limited, have decided to issue 800,000 of these shares as fully paid in the proportion of two new shares for every share held; 400,000 additional shares are offered to shareholders in the proportion of one new share for every share held, at 30s. per share. The right of renunciation is given and the allotment letters can be split.

OLDHAM, ASHTON, AND HYDE TRAMWAYS.—The revenue for 1918 amounts to £50,704, and expenditure (including £1,178 for debenture interest) to £33,347, leaving a net profit of £17,357, and £3,100 was brought in, making £20,457, which is thus disposed of :—To reserve £10,000 (raising it to £54,514); £5,500 further dividend on ordinary, making 6 per cent.; forward, £4,957. Arrangements are being made to refer to arbitration, in accordance with the provisions of the Tramways Act, 1870, the question of the price to be paid to the company by the various purchasing local authorities.

BOURNEMOUTH AND POOLE.—The annual report of the general manager of Bournemouth Municipal Tramways shows that the revenue for the year was £148,449, an increase of £16,776 over the previous year. The surplus has also increased from £26,329 to £31,950. On the other hand, the operation of the Poole section of the system shows a deficit of £8,462, and Mr. Bulfin, the general manager of the tramways department, anticipates that "in the coming year, under present conditions, this loss will be considerably increased." Poole Corporation refuses, in face of every argument advanced by the Tramways Committee of Bournemouth, to allow an increase of fares on the route under their authority.

BLACKPOOL CORPORATION TRAMWAYS.—The report by Mr. Charles Furness, the manager, shows that for the year ended March 31 last the revenue was the highest on record, namely, £140,929, as against £119,339 in the preceding year. The total expenditure was £90,003. Interest and redemption of loans absorbed £20,844, which left a disposable balance of £30,052, as compared with £31,518 in the previous year. The decrease (notwithstanding such an advance in the total receipts) is accounted for by the higher wages and the high cost of materials. The number of passengers was 23,279,202, being three millions more than in the preceding twelve months. The car mileage was 1,242,108, and the receipts per car mile 2s. 2½d., being 5d. more than in 1918.

BRITISH WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY LIMITED.—The report for the year ended December 31 shows that the sum available, including the balance of £51,534 brought from last year's account, amounts to £198,152. The following appropriations have been made :—To special depreciation of plant, machinery, etc., £42,315, dividend on cumulative preference shares at 8 per cent., less income tax, £78,090, balance carried forward, £77,747. The report states that during the year Mr. Lincoln Chandler has resigned the position of managing director, but retains a seat on the board. Captain R. S. Hilton has been appointed

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managing director. In accordance with the undertaking given by the Metropolitan Carriage, Wagon, and Finance Company, Limited, 1,000,000 ordinary shares of the company have been applied for, and have been allotted at par.

LONDON AND SUBURBAN TRACTION COMPANY.—The directors in their report for the year ended December 31, 1918, remark that the continuation of war conditions has intensified the difficulties of the company's undertakings. Shortage of labour and the difficulty of obtaining material has caused a reduction in the number of cars in service, while the operating expenses have increased as a result of additional wages and higher cost of fuel. In consequence of the decrease in dividends received from the subsidiary companies, and to the Tramways (M.E.T.) Omnibus Company finding it necessary to make provision for an early renewal of its fleet, the directors are unable to recommend the payment of any dividend on the preference shares. The gross revenue for the past year amounted to £46,294, as compared with £81,519 for 1917. After deducting all expenses, including debenture and loan interest, and providing for the sinking fund charges on the 5 per cent. debenture stock, there remains a balance of £3,458, making, with £3,634 brought forward, a total of £7,092, which is carried to the next account.

PERSONAL.

Mr. C. R. Everson, manager of Plymouth Corporation Tramways, is retiring on a pension.

Mr. D. Tarbert, cashier of Hull Corporation Tramways, has been appointed manager pro tem.

Mr. E. B. Wedmore has been appointed as director of Research by the Electrical Research Committee.

Nelson Council have increased the salary of the electrical engineer and tramways manager, Mr. G. F. Nayler, by £100.

Mr. J. B. Horner, traffic superintendent of Wigan Corporation Tramways, has been granted an increase in salary of £50 to £250.

Mr. S. C. Tranter, relief charge engineer, London County Council Tramways, has been appointed charge shift engineer, at a salary of £250, rising to £300.

Mr. R. Q. Robertson has been appointed manager of White Motors and Accessories, Limited, in succession to Mr. W. J. M. Bell, who has severed his connection with the company.

Mr. E. M. Lacey has been appointed consulting engineer by Aberdare Council in connection with the extension of the tramway services. The extensions are estimated to cost £100,000.

Sir Auckland Geddes has been appointed President of the Board of Trade, and it is understood that he will postpone taking up his duties as President of McGill University (Montreal) until next year.

Mr. Frank Wood, borough engineer of Fulham, has been recommended for appointment to the position of borough engineer and surveyor of Blackpool, in succession to the late Mr. J. S. Brodie.

Mr. P. V. Hunter, chief electrical engineer of Messrs. Merz and McLellan, has resigned that position to join the management staff of Callender's Cable and Construction Company, Limited.

Inspector E. Challoner, after serving 18 years with Sheffield Corporation Tramways, advancing from conductor to inspector, has been appointed chief inspector of Accrington Corporation Tramways.

Alderman Sir Charles W. Starmer has resigned the position of chairman of the Darlington Tramways and Electricity Committee as a result, it is stated, of unfair criticism by certain members of the Council.

Mr. A. R. Fearnley, general manager of Sheffield Corporation Tramways, has been given permission to assist London County Council in connection with their motor omnibus proposals in their Parliamentary Bill.

Mr. E. W. Sleight has resumed his duties as manager of the Carlisle Tramways Company, on returning from the army. He served in the Royal Fusiliers and King's Own Lancashire Regiment, and was severely wounded.

Mr. C. A. Hopkins, of the Chatham and District Light Railways Company, and formerly of the Swindon Corporation Electricity and Tramways Department, has been appointed chief clerk to the Wigan Corporation Tramways.

Bournemouth Manager's Salary.—The Tramways Committee has recommended the Bournemouth Town Council to increase the salary of Mr. I. Bulfin, tramways general manager, to £1,000 a year, rising by annual increments of £50 to £1,250.

Mr. Thomas D. Kirkland, who has recently returned from service with the forces, has been appointed manager of the Stirling and Bridge of Allan Tramways Company, in succession to Mr. Andrew Henderson, who has resigned owing to ill-health.

Mr. Harry S. Ellis, borough electrical engineer of South Shields, has been appointed to succeed Mr. H. F. Street as borough electrical engineer of Southampton, at a salary of £800 per annum. Mr. Ellis is the son of the late Sir J. B. Ellis, of Newcastle.

Mr. W. P. Young has been recommended by the Tramways Committee of Edinburgh for appointment as traffic superintendent of the Corporation Tramways. Mr. Young, who is a native of Aberdeen, is at present principal assistant to the manager of Belfast Corporation Tramways.

Mr. F. C. Raphael has been appointed manager of the cable and wire department of the Edison-Swan Electric Company, Limited, on his release from the army. Shortly after the outbreak of war he joined the Royal Naval Anti-Aircraft Corps, but in February, 1916, he obtained a commission in the London Electrical Engineers.

Mr. E. M. Munro has ceased to act as representative of Messrs. Brecknell, Munro and Rogers in the London area as from May 31, but he will continue to act in an advisory capacity to the firm. **Mr. A. M. Willis** had been appointed as representative of the firm in the London area, and all communications should in future be addressed to the head office, Thrissell Street, Bristol.

Mr. B. L. Pope, distribution engineer (southern section) of the London County Council Tramways, is retiring owing to ill-health. He entered the Council's service on February 1, 1902, and the Highways Committee have reported that he has rendered valuable service during the whole of the time he has spent with the Council. They recommend that a retiring allowance be granted to him.

Hull Tramways Committee.—The new chairman of the Hull Tramways Committee, Colonel Walker, has been elected chairman of the Staff Sub-Committee, the vice-chairman, Mr. Willoughby, chairman of the Traffic Sub-Committee, Mr. Wokes, chairman of the Finance and General Committee, Mr. Richardson, chairman of the Stores Committee, and Mr. Gibson, chairman of the Claims Sub-Committee.

Mr. Arthur H. Pott, having resigned his position as general manager and engineer to the Metropolitan Electric Tramways, Limited, and the London United Tramways, Limited, is starting in practice as a consulting engineer, but is still retained by the companies mentioned above in an advisory capacity. His temporary address is care of Messrs. F. W. Hayne and Company, 80, Bishopsgate, E.C.2. (Telephone No., London Wall 9574.)

Sir George Gibb's Dual Position.—In the House of Commons, on May 19, Mr. Joynson-Hicks asked if it was the case that Sir George Gibb had returned to the service of the North Eastern Railway Company, while continuing to act as chairman of the Road Board. Mr. Chamberlain, in reply, stated that Sir George Gibb's present connection with the North Eastern Railway Company is in an advisory capacity only, and does not preclude his full discharge of his duties at the Road Board.

Colonel S. B. Smith, O.B.E., who has been appointed manager of the Bristol Tramways and Carriage Company, in succession to Mr. Charles Challenger, who has retired and has been appointed a director, has rejoined his old battalion, the 6th Territorial Battalion, Gloucester Regiment, as major and second in command of the 2/6th Battalion. He was attached to the Royal Flying Corps from May, 1915, and became Lieutenant-Colonel, R.F.C., in May, 1916, and acting Colonel on the formation of the Royal Air Force on April 1, 1918.

Leeds Manager's Salary.—The Leeds City Council has approved the recommendation of the Tramways Committee, increasing the salary of Mr. J. B. Hamilton, the general manager, by £500, making his total annual salary as tramways and commercial manager £2,000. Alderman R. A. Smithson, chairman of the Tramways Committee, in moving the recommendation, said that Mr. Hamilton was appointed in 1902 at a salary of £900, increasing a year later to £1,000. The traffic receipts were then £220,000, while last year they were £723,000. The staff had increased from 1,000 to 2,200.

Mr. E. S. Rayner, borough electrical engineer and tramways manager of Doncaster, has been granted an increase in salary from £550 to £700 for one year, and then to £750. Councillor S. Balmforth, chairman of the Electricity and Tramways Committee, said the traffic on the tramways was three times as great as it was in 1914, though they had not been able to increase the rolling stock. Councillor H. M. Marshall, who supported the recommendation, said that Mr. Rayner had recently proposed a plan for the extension of the system, involving an estimated expenditure of £40,000.

Capt. Ernest E. Sharp, who is known to most tramway managers in connection with his advocacy of the use of meters on tramcars as an antidote to bad driving, has now been demobilised after three years' service, much of it in France. He is relinquishing his position with Messrs. Chamberlain and Hookham in order to start a new enterprise which will appeal to tramway managers. At the moment he is not able to furnish particulars, but will do so shortly. Meanwhile his address is 109, West Side, Clapham Common, London, S.W.4, where he will be pleased to receive any communications from old friends.

Private Fred A. Dowers, R.F.A., a former employee of the Cardiff Corporation Tramways, was presented at the conference of the Amalgamated Association of Tramway and Vehicle Workers with a gold watch, in recognition of his having been awarded the Military Medal. His wife was presented with a silver tea service. Private Dowers was awarded the M.M. for cutting wires under heavy shell fire. The Lord Mayor of Cardiff welcomed him home, and said they were very proud of him and of the decoration he had won.

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Private Dowers was the seventh Cardiff tramway employee who had gained distinction, two others having been awarded the D.C.M., and four others the M.M.

Lieut. L. C. Bellamy has been selected for the position of manager of the St. Helens Corporation Tramways, and will begin duty when the undertaking has been transferred to the Corporation in October next. Lieut. Bellamy is the eldest son of the late Mr. C. R. Bellamy, general manager of the Liverpool Corporation Tramways. After spending some time in the office of the Liverpool Tramways, he became assistant manager of the St. Helens Tramways, and later was for two years assistant manager of the Rangoon Tramways Company. On returning to England, he was appointed general manager of the Ilkeston Corporation Tramways and electrical undertaking, leaving that post when the war broke out to join the Royal Engineers. He has seen service in Gallipoli, France, and Belgium, and was awarded the M.C.

TRAMWAY AND LIGHT RAILWAY NOTES.

BELFAST.

A Deputation to Study Cars.

In order to obtain first-hand information as to the latest types of cars, Alderman Tyrrell and Councillors Turner, M'Donald, Andrews, and Dempsey, with the general manager (Mr. J. S. D. Moffet) have been appointed a committee to visit Liverpool, Manchester, Sheffield, Leicester, Loughborough, Nottingham, London, and Birmingham.

BRADFORD.

An Order for Twenty-six Cars.

Alderman E. Priestley and Councillor I. F. Akeroyd, chairman and deputy chairman of the Tramways Committee, have been authorised to order twenty-six new sets of car motors, fitted with the Spencer-Dawson patent oil brake. Messrs. Dick, Kerr and Company, who are building twenty-six new cars, hope to begin delivery by the end of June, and to complete the order by August. Even when all the cars are delivered the services will not reach the pre-war level, as they will only replace cars now in use, but which are worn out.

CARDIFF.

Fares and Queues.

At a recent meeting of the Corporation Electric Lighting and Tramways Committee, a letter from the National Union of Railwaymen was read, in which it was alleged that the tramway fares were 200 per cent. above pre-war rates, and protesting against the continuance. Sir John Courtis, chairman of the committee, said that the increase in fares amounted only to 16 per cent. on the highest pre-war rates and 50 per cent. on the lowest. Complaints had been received, alleging that the crushing at the car stations and termini had become serious, degenerating into a scramble. Mr. Arthur Ellis, general manager and engineer, intimated that arrangements were being made for the adoption of the queue system wherever possible, that method having been used on one route already with the best results.

DOUGLAS.

Increased Fares.

The Isle of Man Legislature has authorised Douglas Corporation to increase the fares on their tramways by 50 per cent. During the war the tramways made a loss of over £12,000.

DUNDEE.

Height of the Car Steps.

Complaint having been made to the Corporation Tramways Committee that the tramcar steps were too high, Mr. P. Fisher, general manager, has explained that from the construction of the Dundee cars, and the fact that there was only three feet separating the rails, as compared with four feet in most other places, it was not an easy matter to lower the car steps. The committee recommended that Mr. Fisher should consult with the makers of the cars as to how the difficulty might be got over, and at the same time to arrange for improvement of the new cars on the lines indicated.

HULL.

Reconstitution of the Tramways Committee—Tramways Power Supply.

Following the resignation of Mr. W. J. McCombe, manager of the tramways department, the Hull City Council appointed a special committee composed of seven members of the Council to investigate the management of the department. At a special meeting of the Council on May 12, Mr. Digby Willoughby moved:—"That the resolution passed by the Council on November 9, 1918, appointing the members of the Tramways Committee until November 9 next, be rescinded, and that a committee consisting of twelve members (in addition to the Lord Mayor and ex-Lord Mayor *ex-officio*) be appointed to have the management and control of the tramway undertaking of the Corporation." The resolution was carried by 24 votes to 4, and at a later meeting five new members and seven old members were elected to constitute the committee. Col. Walker, the new chairman, said they would have to pursue a vigorous policy in order to get a good and efficient service. Their financial position must be improved. The Electricity Committee and the Tramways Committee have approved the proposal that power for the tramways shall be obtained from the Electricity Committee's station. Hitherto the current has been supplied from the tramways department's station.

LEEDS.

No Liability for a Detached Trolley Head—Free Rides Withdrawn—Piecemeal Renovations.

An interesting decision was given by Judge Parfitt in Leeds County Court on May 1, in an action brought by a railway guard against Leeds Corporation for damages. The trolley head of a car on which plaintiff was a passenger came off and struck him, rendering him unconscious. The Judge held that it was impossible to find defendants guilty of negligence. It ought to be more publicly known that defendants were under no greater obligation to use reasonable care in the manipulation of their system than if it belonged to an individual. The obligation was that reasonable care must be taken to maintain the system in a condition of safety, and, in his judgment, defendants had done so. Judgment was given for defendants, but without costs, as plaintiff had sustained serious injuries. The privilege that sailors and soldiers have enjoyed of riding free on the cars has been withdrawn except as regards men in hospital uniform. The Tramways Committee are giving serious attention to the task of making good the wear and tear during the past four years. Owing to the scarcity of labour and materials, it is impossible to undertake any comprehensive scheme, and the work must be done piecemeal as materials come to hand. Repairs are urgently needed to both rolling stock and tracks, but the *Yorkshire Post* states that the committee have no intention of going abroad for material.

LIVERPOOL.

A Deputation to America Cancelled—Revision of Fares.

Some time ago Liverpool Council agreed to the recommendation of the Tramways and Electric Power and Lighting Committee, that a deputation be sent to United States and Canada to investigate traction systems in view of the fact that the Corporation must shortly make plans for the extension and improvement of transit facilities. The minutes of the committee contained a recommendation that the Council authorise the payment of the actual disbursements of the deputation in lieu of the usual scale of travelling allowances. Sir Archibald Salvidge opposed the recommendation. He pointed out that the chairman of the committee had volunteered the information that the deputation would cost something like £400 per man. The Council had reduced the number to nine, and the tramway manager had intimated his inability to accompany the deputation, owing to urgent needs of the department. Sir Archibald asked the chairman of the committee to withdraw the whole proposal. The recommendation of the committee was defeated, and Alderman Russell Taylor agreed that the resolution sanctioning the deputation should be rescinded. The Corporation on May 9 accepted the recommendation of the Tramways Committee that, in consideration of the additional expenditure caused by the reduction of working hours of the employees, and the increased cost of materials, the revised scale of fares recommended by the general manager on the basis of a stage of 1½ miles for 1d. and the consequent modification of the other stages be approved. Strong opposition was offered, but the chairman of the committee submitted figures showing a deficit of £81,942. The increased cost of labour, material, etc., for 1919, as compared with 1913, was £639,964. The recommendation was carried by 47 votes to 24.

LONDON.

A Suggestion for Lighting Authorities—"Freedom from Accidents" Competition—London United Company's Fares—Stepney Accepts the Overhead System—Open Trailers Asked for—Map and Guide—Disabled Employees—Bonus to Car Crews.

The London Safety First Council, at a meeting held at the Westminster Guildhall, adopted a recommendation from the Street Lighting Sub-Committee to invite Metropolitan public lighting authorities, when able to increase street lighting, to give preference to omnibus and tramway routes, and to extend efficient lighting to entrances to side streets at points approaching main thoroughfares. The Council also resolved to conduct another competition during 1919 to encourage, by the award of money prizes and badges, drivers of all classes of road vehicles, including tramway cars, to exercise every care and discretion in the performance of their duties. Further increases of fares on the London United Tramways have been sanctioned by the Board of Trade, bringing the increases since 1914 up to 100 per cent. By a resolution passed at a meeting of Stepney Borough Council, a veto has been removed which obstructed the development of the tramway system through Stepney, Poplar, and Bethnal Green. For a long period Stepney Council have held out for the installation of the conduit system in Burdett Road, and the County Council offered instead the trolley system. Stepney Council have now accepted the latter offer. Mr. Bridgeman, Parliamentary Secretary to the Board of Trade, replying to Colonel Archer-Shee in the House of Commons on May 23, said that the Board of Trade had no power to compel the London County Council to run open trailer cars. The Council had been authorised by

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Parliament to run trailers on certain routes, and did in fact run them. Colonel Archer-Shee asked whether the hon. member would represent to the Council that the number of these cars was nothing like sufficient, and Sir F. Hall asked if it was only after considerable trouble with the police that permission was given for the running, and that the police tried to hold it up. Mr. Bridgeman replied that this was not a matter for the Board of Trade, but that he would make representations if that was desired. The County Council have sanctioned an expenditure of £660 for the further issue of 500,000 copies of the tramways map and guide. An arrangement has been approved under which a specially selected official in the tramways department will give attention to disabled men returning from war service in order to facilitate their return to their former positions, or to such suitable positions as can be found for them in the tramways department or in other departments. Coal saving bonuses of £1,614 and £1,077 for the quarters ended September 25 and December 25, 1918, respectively, have been distributed among the motormen and conductors in the tramways department.

MANCHESTER.

THE CITY'S CAR REQUIREMENTS.

At a meeting of Manchester City Council, on May 21, Alderman Chapman, deputy chairman of the Tramways Committee, said that they hoped to provide one hundred more tramway cars this year. Each of these would cost over £2,000. In pre-war times similar cars would have cost about £800.

NEWCASTLE-ON-TYNE.

SUPPORT FOR A CENTRAL INDUSTRIAL COUNCIL.

The City Council have approved the report from the Tramways Committee recommending the scheme for a Central Industrial Council of Tramway Employers and Workers, in accordance with the recommendations of the Whitley Report. The full constitution of the Joint Industrial Council for the Tramway Industry was given in our issue of March 13, 1919.

ST. HELENS.

PURCHASE OF THE COMPANY'S TRAMWAYS.

St. Helens Tramways Committee have decided to purchase thirty-six tramway cars from the company. The Corporation will take over the working of the tramway service in September. Mr. L. C. Bellamy has been appointed manager of the undertaking. The salary is £400, rising by annual increments of £25 to £500. The committee propose to make application to the Board of Trade for sanction to borrow £25,000 for tramway purposes.

WALLASEY.

AMERICAN PRACTICE NOT APPLICABLE TO BRITISH TRAMWAYS.

Wallasey Town Council have decided not to send a deputation to America. In the course of a discussion one of the members expressed the opinion that they had men at home quite as capable of dealing with their tramways as anyone in America. The discussion indicated that in the opinion of the Council American methods were of little value as models for British tramway practice.

CONTRACTS AND ORDERS.

Sunderland Council have accepted the tender of B. I. and Helsby Cables, Limited, for l.t. feeder and service cables.

Bolckow, Vaughan and Company, Limited, have received an order for 200 tons of tramway rails, B.S.S. No. 2, from Exeter Corporation.

Johnson and Phillips, Limited, are supplying sub-station switchgear to Hackney Borough Council. The amount of the order is £7,183.

Leeds Tramways Committee have recommended the acceptance of a tender of the British Westinghouse Company for a rotary converter.

Smith and Coventry, Limited, are supplying a 36-in. plain horizontal milling machine, complete with motor and starter, to Bolton Tramways Committee.

Callender's Cable and Construction Company's tender for mains to be supplied during the coming year has been recommended for acceptance by Walsall Town Council.

The Brush Electrical Engineering Company's tender for ten double-deck, top-covered car bodies, with vestibules, has been recommended for acceptance by Walsall Town Council.

Rotherham Council has placed an order for four double deck tramway cars with Dick, Kerr and Company, Limited, at £2,190 each, and 12 new bodies without top covers at £1,705 each.

Bolton Electricity Committee have recommended the acceptance of the following tenders Supply of cable for 12 months, British Insulated and Helsby Cables, Limited, I. Frankenburg and Sons, Limited, and W. T. Henley's Telegraph Works Company, Limited.

Bonus on Steam Consumption to Contractors.—The Highways Committee of the London County Council have sanctioned the payment of a bonus of £1,500 to the British Westinghouse Electric Company, Limited, on the steam consumption under the terms of their contract in respect of two turbo-generators erected by the company at the Greenwich power station of the tramways.

PATENT LIST.

Abstracted for "The Tramway and Railway World" from the Official Journal of Patents.

***** If the inventions have been communicated the names of the communicators are given in italics.**

APPLICATIONS FOR LETTERS PATENT.

The number of the patent is given in brackets.

Disc wheels for motor vehicles (10,695)—W. Beardmore and Company.
Lamp signals in overhead wire systems of electric traction (10,932)—Brecknell, Munro and Rogers and A. M. Willis.
Gearing (10,492)—British Thomson-Houston Company (*General Electric Company*).
Change-speed driving gear (11,003)—M. Brown.
Transmission and gearing for motor cars (10,724)—J. L. Clifford.
Automobiles (10,849)—A. E. Cole.
Mechanically propelled vehicles (10,632)—A. J. Roach-Cuming.
Single, variable, or multiple speed gear driven axle and differential for motor propelled vehicles (10,790)—A. R. Garnett and S. O. Needham.
Variable speed driving mechanism (10,925)—F. W. Gostick.
Variable speed gear (10,988)—H. F. Harper and H. S. Hulme.
Variable speed and reversing gear (11,087)—T. J. Heskett.
Variable speed friction device (10,821)—R. Lowe and E. Wainwright.
Driving mechanism for mechanically propelled vehicles (10,863)—W. Mason.
Joints of rails (10,522)—J. Quinlan.
Convertible body for automobiles (10,659)—A. V. Roe.
Back axles of motor vehicles (11,047)—J. Y. Sangster.
Engine bonnets and cooling arrangements of motor vehicles (11,049)—J. Y. Sangster.
Differential gear for self-propelled vehicles (10,494)—J. C. Schulmayer.
Mechanically propelled road vehicles (10,862)—J. H. Sinclair.
Elastic tires for motor vehicles (10,481)—J. M. Whyte.
Signalling device for use on motor vehicles (11,805)—A. Allchin and A. W. Allchin.
Central drive motor car wheel (11,121)—W. E. Beasley.
Motor car starting handle attachment (11,148)—E. D. Bellamy and C. F. Fitch.
Means for supporting rails (11,207)—C. F. Bengough.
Means for detachably securing pneumatic tires to wheels (11,273)—A. Bennett.
Fuel systems for internal combustion engines for motor vehicles (11,521)—A. E. Berriman and Daimler Company.
Differential and variable speed gear for motor vehicles (11,610)—A. J. Berry and G. M. M. Berry.
Motor vehicles (11,260)—S. A. Bird.
Automatic air brake equipments (11,297)—British Thomson-Houston Company (*General Electric Company*).
Attachment for wheels of motor vehicles (11,372)—E. J. Cayless.
Apparatus for heating tramway or railway cars (11,500)—J. Charpentier.
Pneumatic tires for automobiles (11,491)—F. Creassey.
Tramway and railway truck axles (11,231)—F. H. Critchley and R. Sarginson.
Automobiles (11,747)—R. Eastwood.
Motor vehicles (11,755)—F. L. Freeman.
Means for attaching car bodies to motor chassis (11,155)—W. H. M. Higham.
Means for cooling cylinders of automobile engines (11,672)—H. Morgan.
Temporary axles for motor vehicles (11,400)—G. S. Owen.
Tramway rail (11,228)—J. H. Pestridge and L. J. Pestridge.
Variable speed gear mechanism (11,253)—H. C. Reading.
Engines and transmission systems of motor vehicles (11,118)—J. Y. Sangster.
Means for attachment and detachment of pneumatic tires to and from wheels of automobiles (11,760)—E. Vaughan.
Flexible couplings (11,136)—Birmingham and Midland Motor Omnibus Company and L. G. W. Shire.
Speed indicators (11,024)—R. Berry.
Self-oiling wheel for railway and road vehicles (10,455)—J. W. Boulton.
Motor vehicle driving mechanism (12,394 and 12,704)—Auto-Motive and Accessory Export Company.
Station and stopping-place indicators for trains, tramway vehicles, etc. (12,061)—H. Bingham.
Petrol or oil motor for motor cars (11,945)—C. Blair.
Fluid pressure brake apparatus (11,882)—British Thomson-Houston Company (*General Electric Company*).
Spring seats (11,900)—I. H. Brittain and the General Seating Company.
Driving axles for motor vehicles (11,834)—J. R. Churchill.
Automobile vehicles (12,419)—A. E. Cole.
Railway and tramway vehicles (12,496)—G. L. Cumberland.
Signalling apparatus for trains, etc. (12,271 and 12,418)—J. J. Daniels.

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Trailers for road vehicles (12,284)—R. N. Fairbanks.
Safety locking device for motor vehicles (12,297)—J. H. Farmer.
Variable speed power transmission mechanism (12,146)—M. L. Glover and Company and W. G. McCall.
Disc wheels for motor vehicles (12,196)—R. T. Harman.
Track brakes for tramcars, etc. (12,200)—J. Lacey.
Gear changing mechanism for mechanically propelled vehicles (12,491)—G. H. Lanchester and Lanchester Motor Company.
Railway, etc., steel coaches (12,107)—Metropolitan Carriage, Wagon, and Finance Company and L. Chandler.
Brake beams for railway, etc., vehicles (12,237)—Monarch Door Controller Company and J. Pettigrew.
Method for cooling water for motor car radiators (12,431)—F. Parker.
Steering wheel locking device for motor cars, etc. (12,432)—P. G. Peacock.
Implement for lifting motors (12,225)—H. Pedersen.
Brake blocks, etc. (12,227)—B. Smith.
Mechanism for locking steering wheels and control levers of motor vehicles (12,348)—T. A. Waters.
Lubricating devices (11,874)—Westinghouse Brake Company (*Westinghouse Air Brake Company*).
Self-propelled vehicle brakes (12,954)—J. T. W. L. Adair.
Railway, tramway, etc., locomotive (12,270)—J. A. F. Aspinall and the English Electric Company.
Means for automatically signalling when vehicle passes predetermined point in road (12,658)—E. Badger.
Power transmission mechanism of locomotives, railway motor cars, etc. (12,633)—Baguley Cars, Limited, and E. E. Baguley.
Automatic seat indicator for omnibuses and tramcars (12,879)—G. F. Bale.

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Trolley wheel fittings for trolley poles of electrically propelled vehicles (12,530)—J. P. Barker.
Mechanically propelled vehicles (12,779 and 12,780)—E. W. Bonson.
Safety valve or cut-off for mechanically propelled vehicles (12,781)—E. W. Bonson.
Locking devices for motor vehicles (12,861)—W. Charlesworth.
Safety locking devices for steering gear of motor vehicles (13,068)—J. G. Clark and S. J. Clark.
Means for locking steering wheels of motor vehicles (12,775)—A. J. Cooper and F. E. Cooper.
Fans for cooling engines of motor vehicles (12,604)—J. Cordner.
Locking device for starting handles of motor vehicles (12,536)—H. Dale.
Tramway vehicles (12,657)—T. Dunn.
Lifting jack (13,111)—H. R. d'Erlanger.
Motor vehicles (12,960)—H. Etchells, H. A. Greaves, and F. W. Highfield.
Signalling apparatus for road vehicles (12,513)—H. Fryman.
Anti-skid device for motor vehicles (12,744)—L. Green.
Means for steering trailers (12,715)—A. L. P. Hekking.
Friction driving and speed reducing gear, etc. (12,989)—C. E. Jones.
Lifting jacks (12,847)—A. E. Lake and Lake and Elliot.
Change-speed and reduction gearing (12,932 and 12,933)—T. Lumsden.
Trolley wheel fittings for trolley poles of electrically propelled vehicles (12,530)—C. W. Mallins.
Motor car exhaust silencer (12,795)—H. C. Morgan and W. J. Smith, Limited.
Locking devices for motor vehicles (12,813)—R. H. Morrison.
Indicator or signalling device for motor vehicles (12,913)—E. J. Perrin.
Method of springing overhead arm of tramcars, etc. (13,105)—H. L. Reilly.
Wheels for motor vehicles (12,572)—G. Roberts.
Starting devices for automobiles (13,053)—B. Rose.
Motor vehicles (12,885)—R. E. Simpson.
Motor tip wagons (12,269)—Walker Brothers and E. R. Walker.
Variable speed gear (12,826)—J. Wedderburn.

Specifications Published.

1916.

Vehicle wheels (7,568—*125,120*)—Dunlop Rubber Company, C. Macbeth, and F. J. Keegan.
Motor vehicles (9,365—*125,407*)—R. F. Macfie.

1917.

Speed changing devices for automobiles (16,362—*111,841*)—E. L. Conord.
Dynamo electric machines for use with internal combustion engines and vehicles propelled thereby (19,290—*115,414*)—Bijur Motor Lighting Company.
Air brake apparatus (16,216—*118,078*)—Automatic Straight Air Brake Company.

1918.

Speed changing, reversing, and braking gearing (3,713—*124,862*)—G. Pollard and Menco-Elma Syndicate.
Route indicators for tramcars, etc. (5,747—*124,886*)—B. W. Reed and G. R. Roberts.
Automobile rear axles (6,195—*124,908*)—J. St. L. Maher.
Variable speed gear (8,791—*124,955*)—G. Taylor.
Axle drive equipment for motor vehicles (17,719—*124,186*)—R. E. Fielder.
Brakes for railway, etc., vehicles (4,368—*125,191*)—J. N. Curtis and E. D. Sampson.
Electric signalling systems (6,146—*125,216*)—H. Green.
Spring mountings for motor vehicles (6,227—*125,223*)—Birmingham and Midland Counties Transport Company and G. E. D. Ralls.
Rims or road wheels of automobiles (6,595—*125,233*)—C. H. May.
Steering gear (6,670—*125,236*)—W. H. West and H. J. Inder.
Power transmission mechanism of railway motor cars (6,880—*125,240*)—Baguley Cars, Limited, and E. E. Baguley.
Route indicators for use on tramways and omnibuses (8,099 and *125,264*)—C. H. West.
Lifting jacks (11,274—*125,290*)—C. F. L. King.
Securing rails to tie-bars (16,585—*123,714*)—W. Dunn.
Joints of rails (6,928—*125,517*)—F. F. Benson.
Vehicle lifting jack (11,315—*117,458*)—M. P. Jackline.
Axle housings for motor vehicles and their manufacture (13,081—*125,553*)—F. B. Dehn (*Columbia Axle Company*).
Wheels for motor cars (5,276—*125,704*)—J. Martin.
Trollies or collectors for electric tramways (7,978—*125,792*)—E. R. Thomas.
Differential steering gear for motor vehicles (8,059—*125,794*)—G. M. Blackstone, F. Carter, E. Carter, and R. E. Watts.
Springing mechanism for motor vehicles (11,132—*125,838*)—P. G. Hugh and G. Scammell and Nephew.
Combined lifeguard and shields for the front wheels of motor omnibuses (21,067—*125,912*)—W. J. Wicks.

1919.

Lubrication systems (8,201—*125,930*)—British Westinghouse Electric and Manufacturing Company.

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TRAFFIC RETURNS.

Tramway and Omnibus Undertakings in the United Kingdom.

NAME OF COMPANY OR CORPORATION.	1918. WEEKS ENDED. May 4	May 11	May 18	May 25		1919. WEEKS ENDED. May 3	May 10	May 17	May 24		AGGREGATE. Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£	—	£	£
Aberdare U.D. Council	...	...	...	...	...	...	...	...	...	...	—	—	—
Aberdeen Corporation	2.284	2.268	2.282	2.583	...	2.770	3.093	3.166	3.088	...	51	134,838	+ 23,198
Ayr Corporation	415	449	479	246	...	499	561	606	514	...	1	514	+ 268
Belfast City	7.760	7.738	7.714	7.901	...	9.462	9,740	10.158	10.612	...	8	79,753	+ 18,418
Birkenhead Corporation	2.100	2.099	2.185	2.475	...	2.365	2.427	2,480	2.949	...	7½	19,482	+ 2,774
Blackburn Corporation	1.792	1.672	1.672	2.954	...	1.977	2.157	2.350	2.425	...	8½	19.128	+ 4,197
Bradford Corporation	7.437	7.461	7.916	10.055	...	10.453	10.807	11.457	12.083	...	8	87,751	+ 24,827
Burnley Corporation...	2.059	2.110	2.070	2.786	...	2,955	2.994	3,131	3,148	...	—	—	—
Burton-on-Trent Corporation ...	379	383	418	470	...	463	464	478	487	...	8	3.641	+ 525
Bury Corporation	1.771	1.974	2.067	2.831	...	2.219	2.306	2.422	2.405	...	7½	19.178	+ 3,694
Chatham and District	1.173	1.301	1.301	1.666	...	1.348	1.567	1.687	1.657	...	20	26.993	+ 2,454
Cork Electric	591	618	593	708	...	517	683	663	705	...	20	11.564	− 557
Derby Corporation	1.398	1.461	1.565	1,889	...	1.531	1,571	2.141	2,158	...	8	13,721	+ 1,947
Dundee City	1.621	1.590	1.695	1.718	...	2.151	2.211	2.260	1.907	...	?	1,907	+ 189
East Ham Corporation	1.365	1.398	1.427	1.809	...	1.693	1,955	1.981	2.016	...	7½	14,709	+ 4,006
Glasgow Corporation	28.068	28,385	29.508	30.355	...	31.608	32.196	33.523	34.396	...	51½	1,491,903	+118,463
Glossop (Urban Elec. Supply Co.)...	178	182	181	240	...	218	227	225	225	...	21	4,622	+ 808
Halifax Corporation	2.644	2.489	2.571	4,255	...	3,072	3.215	3,367	3,513	...	7½	24,928	+ 4,809
Halifax Corp. Motor Omnibuses ...	55	55	58	92	...	70	74	76	77	...	7½	563	+ 118
Huddersfield Corporation	3.475	3.481	3.544	5.490	...	4.338	4.711	4.865	4.828	...	8	38.026	+ 7.957
Ilford U.D. Council	931	935	989	1.297	...	1.081	1.242	1.344	1.324	...	8	9.409	+ 1,933
Ipswich Corporation	647	683	756	1.061	...	719	847	909	857	...	8	6.416	+ 854
Isle of Thanet	199	215	263	413	...	624	768	855	913	...	33½	14,355	+ 7,828
Kilmarnock Corporation	226	239	248	244	...	288	316	370	309	...	1½	458	+ 84
Lanarkshire	3.812	3,463	3,659	3.978	...	1,093	1 881	3,692	4,045	...	20	63,716	− 4,866
Lancashire United	...	...	...	...	...	...	...	...	...	...	—	—	—
Leeds City	11 357	11,454	11.566	15.168	...	15.189	16.072	17.351	16.927	...	8	128,656	+ 37,148
Leicester Corporation	4.389	4.481	4.688	5.776	...	5.393	5.871	6.005	6.084	...	—	—	—
Leyton U.D. Council	1.901	2.033	2.098	2.626	...	2.580	2.993	3.270	3.259	...	8	24.090	+ 7,946
Liverpool Corporation	17.992	18.424	18.338	21.233	...	21.654	22.559	23.293	23.361	...	20½	433,588	+ 79,991
Llandudno and Colwyn Bay ...	338	333	367	...	...	483	511	523	...	...	24	8,556	+ 1,878
London County Council	57.175	58.565	60.065	72.089	...	72.154	81.277	82.685	84.039	...	7½	573.422	+144,171
Maidstone Corporation	242	268	251	340	...	336	352	379	365	...	7½	2.873	+ 664
Manchester Corporation	24,885	25,382	25.248	30.144	...	29,026	30,465	31,083	31,737	...	8	238.058	+ 45.164
Newcastle-on-Tyne Corporation ...	8,749	8.569	9.246	10.361	...	8.730	9,037	9,283	9.230	...	8	70,623	+ 1,462
New St. Helens and District ...	...	...	...	...	...	...	...	...	...	...	—	—	—
Northampton Corporation	899	815	1.273	1,138	...	1.170	886	1,306	1.276	...	8	9,584	+ 2,442
Nottingham Corporation	5.618	5,693	5.776	7.471	...	6,668	7.185	7,366	7.274	...	8	53.243	+ 9,944
Oldham Corporation	...	...	...	4.363	...	...	...	...	4.625	...	9	37,460	+ 6,988
Reading Corporation	1,187	1,234	1.244	1,552	...	1,363	1,559	1,579	1,602	...	7½	11,398	—
Rhondda Tramways	...	...	...	...	...	...	...	...	...	...	—	—	—
Rotherham Corporation	2.020	2.043	2.411	2.257	...	2.253	2.261	2.319	2.247	...	8½	19.097	+ 1,505
Sheffield Corporation	13.279	13.568	13.806	14.952	...	16,614	16.446	16.826	17.272	...	8½	147.322	+ 29,886
Southampton Corporation	2,397	2.493	2,446	2.978	...	2,436	2.674	2,731	2.754	...	7½	19,649	+ 1,094
Southend-on-Sea Corporation ...	730	853	873	1,604	...	1,424	1,596	1,773	1.824	...	8	12,453	+ 5,865
South Shields Corporation... ...	...	...	...	...	...	...	...	...	...	...	—	—	—
Sunderland Corporation	2.034	2.092	2.021	2,493	...	2,682	2.708	2.851	2.888	...	8	22,415	+ 5,505
Swindon Corporation	321	324	280	...	...	296	303	335	...	...	6½	2,031	+ 180
Torquay Tramways	847	752	750	1.172	...	949	1.070	1.044	1,090	...	20	17.184	+ 2,105
Tyneside Tramways and Tramroads	994	906	1,006	1,781	...	870	989	1.100	1,047	...	21	18.533	− 377
Wallasey Corporation	1.695	1,744	1,721	2.380	...	2.231	2,456	2.509	2.583	...	7½	19,088	+ 5,265
Walsall Corporation	1,181	1.194	1.206	1.680	...	1.392	1.384	1,389	1.416	...	8	11.099	+ 1,267
Walthamstow U.D. Council	1.311	1.412	1,505	2.056	...	1.483	1.827	1.983	1.959	...	8	14.332	+ 3,212
Warrington Corporation	741	763	712	850	...	865	892	875	885	...	7	6,699	+ 1,144
West Ham Corporation	4.009	4,150	4,235	5.122	...	4,907	5,535	5,768	5,676	...	7½	40,689	+ 9,292
Wigan Corporation	...	...	...	...	...	...	...	...	...	...	—	...	...

*** A number of undertakings suspended the issue of traffic returns for the duration of the war.

Colonial and Foreign Tramway Traffic Returns.

NAME OF COMPANY.	1918. WEEKS ENDED. May 4	May 11	May 18	May 25		1919. WEEKS ENDED. May 3	May 10	May 17	May 4		AGGREGATE. Wks.	1919.	Increase or Decrease.
	£	£	£	£	£	£	£	£	£	£		£	£
Anglo-Argentine	57.721	59.028	56.634	54,104	...	65,483	56.085	64.295	60.808	...	20	1,165,255	+ 57,815
Calcutta ... ... Rs.	75,438	74,683	73,158	71,308	...	83,269	82,452	85,927	83,720	...	20½	1,746,109	+241,797
Madras ... ... Rs.	...	...	42,003	(2 weeks)	...	...	...	46,625	(2 weeks)	...	19	318,193	− 44,534
Pernambuco	4,441	4,302	4,323	4.300	...	5,566	5,806	5,688	5,725	...	20½	112,588	+ 16,897

Companies issuing Monthly Statements only.

	1917. Dec.	1918. Jan.	Feb.	March.	April.	May.	1918. Dec.	1919. Jan.	Feb.	March.	April.	May.	Wks.	AGGREGATE. 1918-19.	+ or −.
	£	£	£	£	£	£	£	£	£	£	£	£	—	£	£
Ballarat & Bendigo	3,228	4.505	3,573	3.803	...	...	3,884	4.504	3,602	3,051	...	...	48	42,131	+ 1,444
Brazilian Trac. Mlrs	8069000	7837000	7315000	8094000	8330000	...	8531000	8522000	7972000	9330000	9208000	...	17	35,032,000	+3,456,000
Brisbane	35.019	34,500	32.009	35.530	35.530	...	38.135	38.575	34,380	39.380	38.775	...	17	151,110	+ 13,541
British Columbia $	555,555	559,569	501.150	510.892	515.417	...	691,065	667,489	645.415	649.120	631.988	...	43	6,022,107	+1,011,419
Buenos Ayres L'c'z.	40.901	38,902	34,397	42.647	41,643	41,315	50.460	41,556	42,429	47,370	43,607	47,317	48	481,503	+ 52,123
Burma	26,224	25,430	22,985	27,906	27.614	...	34,593	38,265	35,926	38.440	36.815	...	39	325,985	+ 86,230
Cape Town	...	...	...	...	19,011	...	...	...	...	...	22,564	...	—	—	—
Carthagena & H....	4,424	4.011	4.031	5.316	4,200	5,027	2,950	3.655	2,351	2,400	1,786	3.226	21	13,418	− 9,167
Cordoba	...	12,844	12.972	...	...	...	...	13,942	13.549	...	...	...	48	159,203	+ 11,492
East India	1.099	1,176	1,318	1,729	1,791	1,920	2.048	1,970	1,689	2.016	1,920	2,131	43	19,679	+ 5,472
Kalgoorlie	3.044	2.522	...	...	...	...	2.848	2.562	...	...	...	...	4	2,562	+ 40
La Plata	4.606	4.711	4.746	5.348	5.169	5,105	5,792	5,730	5.698	6.592	5,630	5.702	22	29.352	+ 4,274
Lima	43,198	43,561	41,921	42,076	...	...	47,887	45.362	46,082	50,716	...	...	13	142,160	+ 14,602
Manaos ... Rs.	...	...	...	...	...	...	...	...	...	...	...	...	—	—	—
Manila ... $	169,000	167.000	168.000	172.750	...	...	236,612	231,585	211,368	207,792	...	...	13	650,745	+ 142,995
Monte Video ...	34.025	36,016	34,573	36,659	33,704	32,301	38.441	40,910	38.772	41,070	37,014	37,382	31	265,287	+ 26,949
Peruvian ... $	1101090	1189350	925 410	...	...	...	1057990	1009650	943,470	...	...	...	34	7,973,835	− 229,195
Para	23,315	24,060	22.198	24,848	24.745	...	23,800	24,515	23,248	26,022	25.342	...	21	122.927	+ 3,761
Port Elizabeth ...	...	...	...	...	4.028	...	...	...	...	...	5,576	...	—	—	—
Rangoon	5,438	5.361	5,662	5.955	5.885	...	6.188	6.373	5,694	7.533	6.217	...	17	25.817	+ 2,954
Toronto ... $	...	1068319	981 933	1113472	1065766	...	...	1106840	1015797	1083285	1051960	...	17	4,257,882	+ 28,392
Winnipeg ... $	...	334,642	298.899	307,289	...	...	...	390.539	371.162	384.937	...	...	13	1,146,638	+ 205,808

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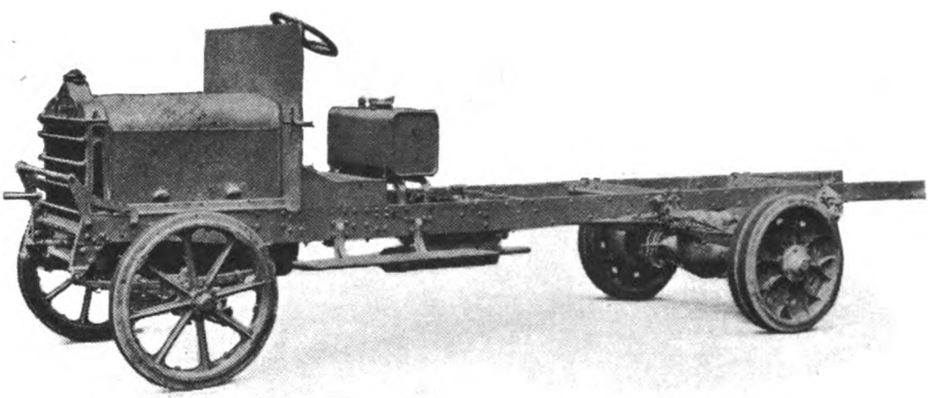

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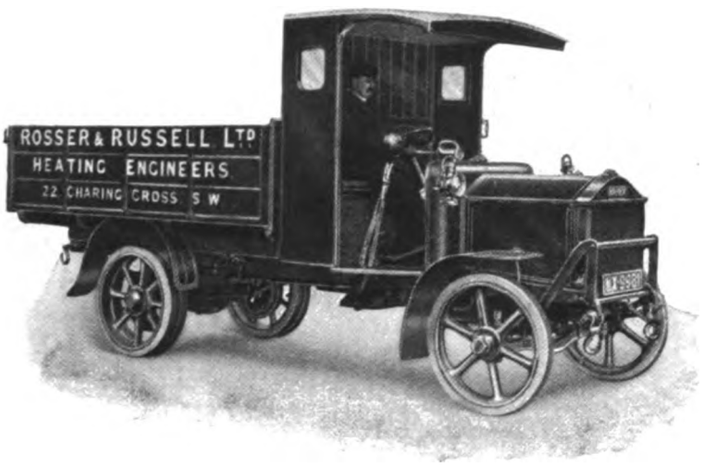

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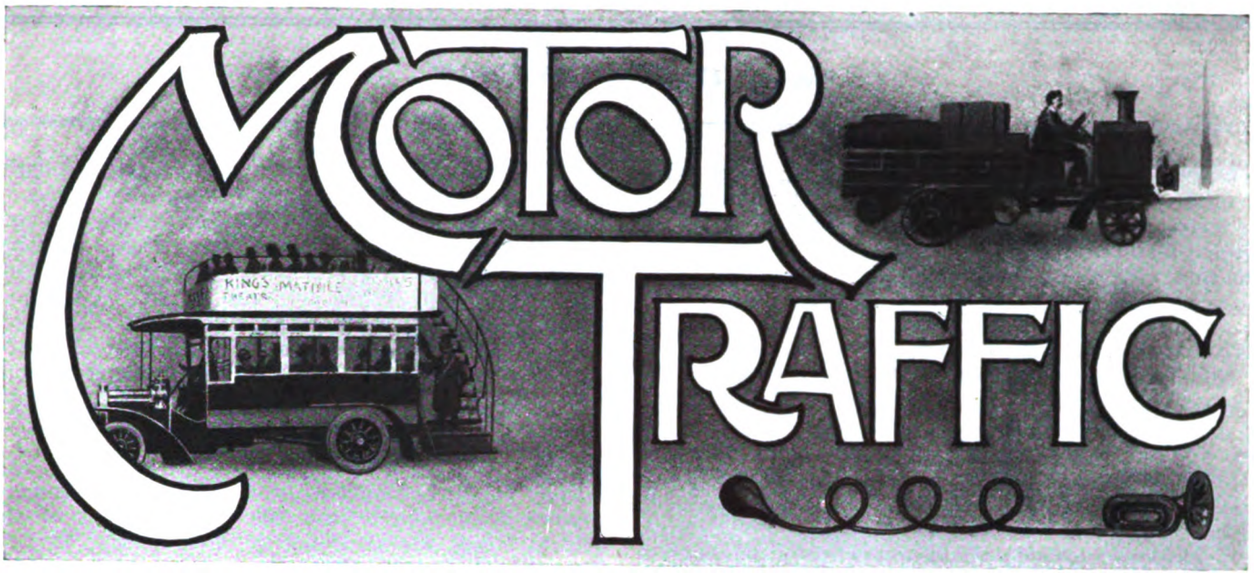

ROADS AND TRANSPORT EXHIBITION.

A forthcoming event of very special interest to all municipal officials, and particularly those interested in any way in the maintenance of roads or the provision of transport facilities, will be the Roads and Transport Congress and Exhibition which is to be held at the Agricultural Hall in November next. This event is a natural development of the road conferences held annually, with the exception of an enforced interval during the last two or three years, by the County Councils Association. The idea of coupling the conference or congress with an exhibition is not a new one. On previous occasions the annual conference has been accompanied by a show illustrative of road materials, their methods of application, and the machines used for applying them. It is only natural that when so many prominent officials come together for the mutual exchange of information and opinions, the opportunity should be given them of examining the new materials and methods submitted for their consideration. The importance of the forthcoming development is summed up by the introduction of the word "transport" into the title of the event. This is a recognition of the fact that the man who is interested in roads cannot take a detached or prejudiced view of the vehicles that use them. The roads exist for the purpose of traffic, therefore while to some extent the road surveyor may try to make traffic what he would like it to be, he must in the main take it exactly as it exists, and cater for it to the best of his ability. It is therefore very useful to him, when he comes to discuss road matters, to be given an easy opportunity of becoming familiar with the construction and the ubiquity of modern road vehicles. It is equally important that during discussions he should hear not only the views of surveyors, but equally the views of those who make and use road vehicles. Failing this, he is apt to regard the road that he has built too much as a work of art that ought to be protected from all rough usage, and the vehicle too much as a sort of Juggernaut which is deliberately devised to break up his precious highways. It must be candidly admitted that the fault is not all on one side. Vehicle interests for their part are more than a little inclined to resent the very slightest control imposed for the purpose of preventing roads from being unnecessarily damaged. By discussing road and road traffic problems from all conceivable points of view, we are likely to arrive all the quicker at a proper appreciation of the basic fact that roads and road vehicles are merely different parts of one entity, together constituting a road traffic system.

WIDENING SPHERE OF MUNICIPAL MOTORS.

It is, of course, impossible to say yet whether the Roads and Transport Exhibition will be well patronised in respect of vehicle exhibits. We sincerely hope that such will be the case, because we believe that it is in the interests of the motor industry that municipal officials should become familiar with its products and the personalities responsible for them. This makes for better mutual understanding and for the extended use of motors in municipal service. The whole trend of events is steadily making the sphere of the municipal motor wider. In all probability municipalities and County Councils will be required by the Government to organise large numbers of services into rural districts. It is certainly in the interests of the motor industry that this should be the case; and the industry should take the opportunity of showing the municipal official, who has a big potential influence on orders, how adaptable the modern motor chassis is to the reception of a great variety of types of bodies, each fitting it for some distinct purpose or group of purposes. Even if the chassis itself is not of the very latest type, various new forms of utility may often be effectively illustrated by showing it equipped with some more or less original form of body work. If the exhibition referred to contains a thoroughly representative collection of complete motor vehicles for various kinds of municipal and County Council use, its educative value will be immense, and its influence in promoting business will be widely felt.

THE PRESENT SCOPE OF THE ELECTRIC VEHICLE.

The paper which Mr. Ayton recently read before the British motor manufacturers on the subject of electric vehicles in commercial use constituted a very valuable addition to the literature of the subject. As a well-known advocate of this type of vehicle, Mr. Ayton might have been expected to show a certain amount of prejudice and to claim rather more than many people would be willing to concede. He avoided both these errors. In fact, upon the latter point, he emphasised the limited sphere or utility of the electric under existing conditions, and pointed out that it is really fitted to compete less with the petrol vehicle in the sphere which the latter already occupies than with the horse delivery van used in urban areas under

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MOTOR TRAFFIC

conditions such that the petrol vehicle has not succeeded in ousting it. His view may be expressed by saying that he looks at the broad question of mechanical *versus* animal transport, and that he is engaged in advocating the increased manufacture of a type of vehicle which may help to accelerate the victory of mechanical power.

ITS ADVANTAGES AND LIMITATIONS.

No sane man would contend that the electric vehicle has no merits other than those possessed equally or in a higher degree by the petrol vehicle. "Electrics" are admirably controllable in traffic; they are easy on tires on account of their steady pull, and they use no fuel while standing still on collection or delivery work. They are clean and of good appearance. Acceleration is steady, and not jerky; the vehicle starts automatically and without manual effort, but with complete certainty. It has advantages as regards the absence of fire risks. Its control is extremely simple. Its repair bill is small, and it is highly independent of extremely severe weather conditions. Its great demerit is, of course, its limited radius of action. To overcome this trouble, a very comprehensive organisation of charging stations all over the country is a necessary preliminary. Even then, charging must necessarily take time. A secondary drawback is its high price, but this, no doubt, is largely due to the fact that as yet the electric is not the subject of quantity production taken to the highest possible point. Then again, it is apt to be rather heavy, and its speed is not equal to that of a petrol vehicle. So long, however, as we recognise its special sphere of utility for town work, these latter points are not of the utmost importance. A vehicle that is really flexible, easily controlled, and possesses high power of acceleration, can often average better in traffic than one inferior in these points but superior as regards maximum speed capability.

LIGHTS ON MOTOR VEHICLES.

During the past years we have been using motor vehicles under a series of temporary regulations. A number of war-time orders have applied to the lighting of motor vehicles. Some restrictions have, of course, now been removed, but other regulations are destined to become more or less permanent either in their present or in a modified form. There are, for example, regulations as to the positions which vehicle lamps must occupy. The side lamps must be on the extreme left and right of the vehicle so as to show its width. This is really a common-sense precaution, because the lamps themselves, when lighted, make it difficult for an approaching driver to see the vehicle behind them on a dark night. Realising the purpose of the regulation, which is obviously to avoid anything in the nature of a head-on collision at night, we see that the regulation cannot be effective if the body or load extends any material distance sideways beyond the lamps. It is not always an easy matter to arrange that the lamps shall not be misleading as to the width of the vehicle, particularly if we take the case of a steam lorry, having lamps placed on either side near the forward end of a boiler. It is evident that lamp brackets of great length would be needed to indicate the full width of, let us say, a big pantechnicon body. Lamps so placed as to do this would probably suffer from frequent damage, especially when driving in dense traffic. Despite this difficulty, the owner of the vehicle may expect before long to find himself the subject of attention by the police unless he manages to get his lamps so far apart as to indicate very approximately the maximum width of his vehicle. Another minor point is that the rear lamp must be on the right-hand side of the centre line, and should be as short a distance as possible inside the off rear wheel. There is no great difficulty in conforming to this rule. Up to the present the authorities have not worried about trifling breaches of the regulations, but their attitude is likely to become a great deal stiffer in the future.

SLOUGH MOTOR DEPOT INQUIRY.

The Joint Committee of Lords and Commons appointed to inquire into the establishment of the Central Motor Repair Depot at Slough began to hold the public inquiry on May 3, and continued its sittings till Wednesday, June 4, when the inquiry closed, and the Committee decided to consider its report in private. During the course of the inquiry many witnesses were examined, and much interesting evidence was submitted, but the chief protagonists were Lord Inverforth on the one side and Lord Desborough on the other. Lord Inverforth admitted that there had been mistakes made both at the inception of the scheme and during the course of modification consequent upon the signing of the armistice, but contended that the repair depot was both economical and necessary, and that the site and structure were well chosen and properly designed. On the contrary, Lord Desborough argued against the scheme on the following grounds:—Error of policy underlying the principle of establishing a single central depot. Absence of any need for the depot either as a war measure or for post-war purposes. Ill-defined purpose of the scheme and the persistence of the Government in proceeding with it. Unsuitability of the water-logged site. Extravagant cost and size of the works. Unnecessary diversion of labour. Conditions of employment of contractors.

Motor manufacturers await with great interest the judgment of the Committee and the issue of its report.

THE "SAFETY FIRST" MOVEMENT.

Representatives from local authorities, technical institutes, railway companies, omnibus companies, and industrial and insurance bodies attended the annual meeting of the "Safety First" Council, held in Westminster Guildhall, under the chairmanship of Mr. Joynson Hicks, M.P., assisted by Mr. H. E. Blain and Mr. A. P. Johnson, honorary secretaries. The Council was able to report satisfactory results of their action in regard to street improvement and the lighting of omnibus and tramway routes in several localities. A "Freedom from Accidents" competition had been established for drivers. An essay competition for school children had also been arranged. Reports from local propaganda meetings gave encouraging signs that the public interest in the subject of "safety" was being awakened to a high degree. The Publicity Committee reported that the City Corporation and twenty-eight local authorities in and around London had consented to extensive display of posters.

Recently the Council has issued two posters of great value. In the larger poster instructions are given to motor drivers, with vivid illustrations, showing how dangerous are practices which the men are apt to regard as of little consequence. On the smaller poster is displayed a picture so real and so true to horrible fact as to send a thrill through the heart of the most stoical. A bright young girl has gleefully escaped the hold of the nurse, shooting off on her scooter, and running unconsciously right in front of a huge motor wagon. The wild despair of the nurse, the swift promptitude of the constable, and the horror of the driver are pictured with fidelity, while the innocent joy of the child, wholly unconscious of its terrible situation, adds poignancy to the scene. No more powerful "safety first" warning has yet been issued, for everyone who looks at it realises how easily such an accident may happen.

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MOTOR TRAFFIC

THE FRENCH MOTOR TRANSPORT CORPS.

By Robert Altermann.*

France possessed before the war about 80,000 touring cars but few lorries. To encourage the construction and use of commercial vehicles the Government organised annual races, of which full reports were regularly published. The programmes of these races were designed to develop certain definite types in order to approximate, as far as possible, to the military lorry. As the result of these races, a certain number of vehicles were passed by the Government for the award of bonuses. Any purchaser of these lorries undertaking to keep them in good running order, and to hold the specified number of spare parts in his possession, became eligible for four successive bonuses, the first at the time of buying and three later on to defray the cost of upkeep if the vehicle was found on inspection to be in a satisfactory condition. At the same time the manufacturer, whose trade naturally benefited through winning the bonuses, undertook to keep in stock a further number of spare parts to be issued for each accepted vehicle on mobilisation.

In the first fortnight of January of every year a census of all motor vehicles was taken, owners being required to make the necessary depositions at the centres of local government. From these a register was compiled, and the necessary extracts forwarded to Army Corps Headquarters. Lorries and commercial vehicles that had not passed the Government test underwent classification as to their condition and adaptability for military requirements; this information was also passed on to the army authorities. They in their turn compared these figures with actual needs, and made out definite requisition lists, individual owners being warned that in the event of mobilisation they would be required to bring the selected vehicles before a committee of requisition to be held at a specified place.

As a general rule, touring cars were not required by the annual classification committee, for their number was considerably in excess of mobilisation needs. It was found sufficient to arrange for the purchase of a certain number of cars voluntarily offered upon certain conditions by their owners. The latter undertook to put these cars at the service of the Government for the annual periods of military training, each owner driving his own car. As a recompense for these loans, they would be called up in the event of mobilisation as drivers of the cars in the motor transport service. If the number of touring cars thus offered in any area was found to be insufficient, the remainder were brought before the classification committee, the best chosen, and the owners informed that these would be required upon mobilisation.

The *personnel* required for the motor transport service were obtained from the drivers and other workmen due to join the baggage train of their area. Drivers of cars that were requisitioned who happened to belong to any other arm were attached for duty with the motor transport service. Officers required to complete the establishment were selected according to their professional and technical abilities from the other arms, and transferred if they so desired. Training for this *personnel* was provided from 1913 onwards by the organisation of finishing schools. The first of these was at Vincennes, where a number of officers were put through courses.

MOBILISATION.

Mobilisation had been prepared by the fourth sub-division of the general staff (motor section), and took place on the lines already explained. Vehicles proceeded in groups to the mobilisation centre of their district. There they were received by the commandant, who took them over, enrolled the *personnel*, had all machines put in working order at an emergency workshop, and then led the convoy on the date fixed to an organisation centre. There were four of these centres, set up at Versailles, Rheims, Dijon, and Lyon, and here lorries of the same manufacture were formed into administrative sections, and despatched to the different armies together with the necessary number of cars for the use of the general staff.

The 1,049 omnibuses of the Compagnie Générale des Omnibus de Paris had been divided up into units, some for the transport of troops, others for the provision of fresh meat. Of these 192 were immediately despatched without alteration for the former object; 770 underwent certain prearranged modifications in the company's workshops, including replacement of windows by zinc screens, removal of seats and cushions, insertion of meat hooks, etc. In addition 87 omnibuses and 22 lorries were requisitioned for use as mobile workshops and travelling offices. The omnibuses were gathered together in their own depots, and despatched in administrative units direct to the mobilisation centre, the drivers being put as far as possible in charge of their own vehicles.

DEVELOPMENT DURING THE WAR.

The army's requirements for motors and vehicles of every kind steadily increased during the war. This increase was most noticeable in the number of lorries and motor ambulances. At the outset lorries had only been used in the transport of food and ammunition, and in 1914 this only amounted to an average of 18,000 tons a month; by 1915 it had risen to 300,000, by the end of 1916 to 750,000, and at the time of the armistice had reached 900,000 tons per month. During this expansion the lorries were put to an ever increasing number of uses, including the transport of fighting units; 460,000 men per month were carried in 1915, 750,000 at the end of 1916, and 900,000 at the time of the armistice. Other new services rendered were road-making, the transport of logs, and of telegraph sections.

Departure of Paris Omnibuses for the Front in August, 1914.

At the outbreak of war there were very few motor ambulances, only a small number of delivery vans having been converted to this purpose with the assistance of the first available material. This service was entirely reorganised and extended until it became possible to attach an ambulance section to every division. The number of sick and wounded that have been removed every month has been very considerable; for example, at the end of 1916 it amounted to 300,000, though of course each man may be counted several times on different journeys from field ambulances to hospitals and from hospitals to railheads. The artillery made more and more use of motors as their means of rapid transport; for example, motor guns, field pieces mounted on cars, armoured cars, tractors for heavy guns, and motor vehicles for ammunition supply. All these vehicles, however, like those of the air service, do not really belong to the motor transport corps.

The motor corps itself consisted of 8,500 vehicles in August, 1914 (6,000 lorries and 2,500 cars). At the end of 1915 this figure had reached 30,000 (18,000 lorries and 12,000 cars), by the end of 1916, 40,000 (25,000 lorries and 15,000 cars), and by the armistice it had risen to over 100,000 vehicles. It was easy to requisition almost all the cars required, while a third of the heavier vehicles were purchased in America, one-tenth in Italy, and the remainder in France.

This increase of material made necessary a fourfold increase of *personnel*, and in order that the number of officers required to command the new units should not cause too heavy a drain upon the other arms, N.C.O.'s and even soldiers who seemed from their profession or ability likely to qualify as officers, underwent a competitive examination every six weeks in their own army. Those who were accepted (three or four per army) were sent to a cadet school at Meaux, where on the completion of the course they were promoted sub-lieutenants in the motor corps. Soon afterwards

* M. R. Altermann's article has been specially translated for The Tramway and Railway World by permission of *Le Génie Civil*, in which the article was first published.

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Preparatory courses for the cadet school at Meaux were set up at Châlons, at Toul, and at Belfort.

The *personnel* employed by the motor corps amounted by the end of 1916 to 75,000, and must have risen to 100,000, exclusive of the artillery, by the time of the armistice.

TYPES OF VEHICLES EMPLOYED.

Cars are divided into the following classes:—Open cars, from 10 to 18 H.P., for commanding officers; open cars, from 12 to 20 H.P. (70 per cent. of the whole); closed cars, 16 to 24 H.P., for the staff (20 per cent.); and cars of 24 H.P. and over for the same use (10 per cent.).

The ordinary lorries with solid rubber tires are fitted with seats for twenty men. Their normal load varies from two to three and a half tons, averaging three tons. They are organised as sections of 17 or 18 lorries, including one travelling workshop and one trailer kitchen; each vehicle is in the charge of two men, and each section has an average loading capacity of 35 tons. Four sections under the command of a captain make up a group, and are able to carry one day's rations for an army corps, two echelons of field gun ammunition, two heavy batteries complete, the kits of a division, and a battalion of infantry. Several such groups are on the strength of every army, and in addition there are the G.H.Q. reserves.

The ordinary type of tender is of 12 to 16 H.P. They run on pneumatic tires, have seats for ten men, and a capacity for one and a half tons useful load.

The Paris omnibuses, of 30 H.P., are provided with special seating arrangement for the transport of troops. They are on solid tires, and can carry a load of two tons. A section is made up of ten omnibuses with a travelling workshop. A group will carry a battalion in the same way as a group of lorries, but with the advantage that it consists of only 40 vehicles instead of 70.

The majority of the Paris omnibuses, however, as we have already indicated, were employed for the transport of fresh meat. Their useful load is also two tons; seven or eight of these with a travelling workshop make up a section allotted to a division. In the case of a cavalry division only four omnibuses are included in the section. The omnibuses take the meat from the slaughter-houses to the divisional ration dump, where it is transferred to ration wagons belonging to the various units.

Ambulances are normally tenders of 12 to 20 H.P., fitted with pneumatic tires, and arranged inside for the reception of the wounded. Their load is about 16 cwt., and 20 vehicles, together with the work-

Interior of Omnibus Fitted for the Transport of Meat.

shop, make up a divisional field ambulance capable of dealing with 80 to 120 stretcher cases and 120 to 140 sitting up.

Tractors are lorries with four driving wheels which are able to get over bad ground; their principal function is to move guns. There are in addition tractors of a special type, with a capacity of 45 H.P. These are provided with caterpillars, worked by two driving wheels which cog into an endless chain of dented metal plates instead of acting directly upon the ground. The caterpillars were largely used in the Vosges for moving artillery into positions which could hardly have been attained by other methods; the tanks are provided with similar contrivances which had been thought of before the war in connection with agriculture.

ORGANISATION.

The motor service is under the control of a director; under him there is an officer in chief command of the service for each army.

Omnibuses Transformed into Supply Vans.

The director is known at G.H.Q. by the abbreviation D.S.A., the officer in command of the army as C.S.A. The D.S.A. has under his direct orders the following organisations:—(1) The base vehicle parks where new and rehabilitated material is received, and where new units are formed for despatch to the armies; (2) the sorting park, whither all damaged vehicles are returned by armies here as many as possible are restored to a serviceable condition, the remainder being sent back to the manufacturers; (3) the central motor store, which obtains all accessories and spare parts required for the upkeep of vehicles in commission, and despatches them to the armies as need arises; (4) the cars required by G.H.Q., and the reserve transport groups (rather more than are required to supply two Army Corps), and all the base transport; (5) the base workshops for periodical inspection of army vehicles.

The C.S.A. controls (1) the staff cars and all the motor transport of his army, including corps and divisional staff cars, one section of the ration omnibuses, and one section of ambulances per division; (2) an army motor transport park where repairs can be carried out, and also a certain number of oil and petrol stores within his area.

The base vehicle parks are situated at Versailles and at Dijon; the former deals with all vehicles manufactured either in Paris or in America, the latter with those coming from Lyon or Italy, and also repairs the bicycles and motor cycles of all the armies (approximately a hundred cycles and four motor cycles daily). It issues to armies all special apparatus required by motorists. The sorting park is at Paris. Three-quarters of the broken-down vehicles received from the armies are put in order and returned to Versailles. The number of vehicles scrapped was not large—about 30 lorries and 50 cars per month. The central motor store has two branches, the first for objects such as tires, lamps, tools, etc., that are useful for all vehicles, the second for spare parts peculiar to individual types. On an average the store received 10,000 indents daily from the armies. It was served by a special postal arrangement necessitated by the frequent movement of units from one army to another. This only functions, however, from store to armies; from armies to store the ordinary post is employed. The base workshops attend to those vehicles requiring too lengthy overhauling for armies, and in the case of an advance they pick up and restore all derelict vehicles left behind. Each workshop specialises in one or two types, and carries out periodical inspections of all vehicles of those types.

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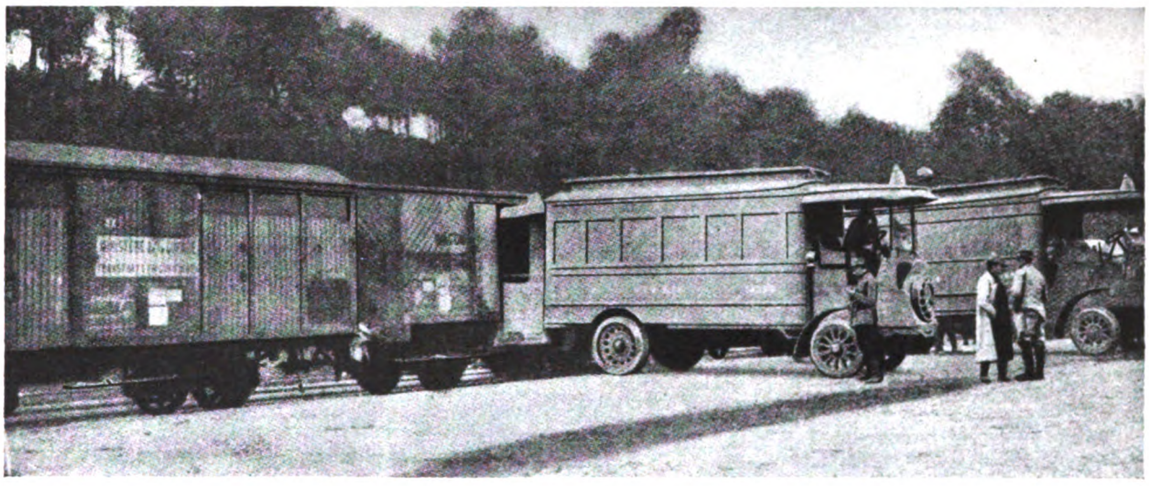
The army motor transport park is under the command of a captain, and includes a section for the sorting of motor transport *personnel* and two or three park sections. An investigation committee examines all the unserviceable returns from units in order to find out what has been broken or worn out through lack of attention or accident, and what is of faulty manufacture, with a view to taking action against the maker. Park sections are repair shops, mobile, like the park itself, with the army to which it belongs. Their non-combatant *personnel* includes as a rule a hundred specialists divided among several shops: assembling and tuning up; machining; soldering, brazing, and forging; body repairing and painting. A section is set up as far as possible on the site of some requisitioned factory. It includes a certain number of movable hangars and machine tools that are on its establishment (three lathes, drilling machine, a die-stamping machine, two grindstones, and a dynamo for lighting, all worked by a small petrol engine of 12 H.P.). To one section in every army is attached a certain number of reserve motor omnibuses, which allow of the periodical relief of meat wagons, so that this important *matériel* may be regularly overhauled. In this way each section passes through the workshop in turn, its omnibuses being taken down and thoroughly overhauled by special gangs of workmen.

An army park moves as rarely as possible, so as not to interfere with the continuity of its work; it is considered that it should make a corresponding advance when the front has moved a distance of 100 to 150 kilometres. The transportation is effected by means of the motor transport section belonging to the army; an army park consisting of two sections will have about 120 tons to move, and this can be completed by instalments in less than eight days without interfering seriously with the work.



Paris Motor Omnibuses in Army Transport Service.

USE OF MOTOR TRANSPORT AT THE FRONT.

It will be interesting to refer to the regulations laid down for the employment of the various sections. For the best use to be made of the lorries it is essential that they should not be specialised; the greatest economy can only be obtained by using all lorries for every purpose. For the transport of troops the lorries are drawn up in a column at a spot on the road that has been chosen beforehand; the troops arrive in column of fours, each battalion halting by its allotted lorries. The companies are then taken to their own sections, and split up into squads according to the size of the lorries. Loading in this way is completed in twenty minutes. When some point of the front has to be supplied in a great hurry, as in the course of the battle of Verdun in 1916, experience showed that it was best to organise the road traffic like a railway. The route is reserved for the motor transport under the orders of G.O.C. lines of communication; uninterrupted circulation is then possible in both directions, and sections are established to facilitate policing and upkeep. A control committee arranges the traffic regulations, march tables, and points of loading and unloading, and divides up the available labour for effecting road repairs. The committee is in telephonic communication with all the officers in charge of sections, and these officers arrange for the setting up of all the traffic signs required by day and night to prevent blocks; they also arrange when necessary for traffic which has to cross the road and deal with all stoppages. Speeds are thus regulated: lorries, 10 miles per hour; ambulances, 12 miles per hour; cars, 20 miles per hour. A special service provided by the nearest army park arranges for breakdowns—an average of 1 per cent. of the vehicles. As a rule the loading points will be railway stations. Here there will be several loading sheds, one being filled by arrivals while the motor transport is clearing another; each shed is capable of accommodating two sections of lorries at the same time. With a sufficient number of loaders, 600 men per refilling point, 80 tons (a full load for two sections) can be handled in two hours, making about 1,000 tons per day. With such arrangements the average number of vehicles passing a given point in each direction will be about five per minute.

Taking a fortnight, say from February 22 to March 7, 1916, during the battle of Verdun there were 600 lorries covering 85 miles daily, a total of 750,000 miles, or three times the distance round the earth. At the same time troop-carrying lorries covered more than 1,000,000 miles. In March, 1916, more than 300,000 men were carried over this route.

Such were the general lines of the organisation of the motor service, which has probably been of no less importance to the armies than the air force; it has fed them, and enabled them to move rapidly from one critical point to another as required in regions where the railways have been completely destroyed. The motor service should therefore not be forgotten among the other arms, old and new, which France and her Allies developed from day to day until the hour of victory.

NATIONAL HAULAGE ASSOCIATION.

TRANSPORT SCHEME TO EMPLOY EX-SERVICE MEN.

At the first annual meeting of the Ex-Officers' Employment Bureau, Captain Redgrave outlined a scheme called the National Haulage Association, which had, he said, the sympathy of the Ministries of Munitions and of Supplies. They proposed in a few weeks to start a large haulage company which would employ none but ex-service men. They hoped to have between 400 and 500 good jobs for officers, and 4,000 appointments for ex-service men. When the scheme was first suggested it was very difficult to get business people to associate themselves with it, because they said it could not be run commercially if none but ex-service men were employed. But there was a shortage of national transport to-day, and no big company could undertake haulage for any large new contract.

BRITISH SCIENTIFIC PRODUCTS EXHIBITION.

The forthcoming exhibition of British Scientific Products promises to be of even greater interest than the very successful show of last summer. All the available space at the Central Hall, Westminster, where the exhibition will be held, has now been allotted, and the organising committee announce that they can entertain no further applications. The exhibition will be open to the public from July 3 to August 5, 1919. Its scope will be more extensive than was possible at last year's display, when war conditions made it necessary to withhold from public view much of the scientific and technical work carried on in Great Britain. Striking testimony will be furnished of the enterprise of British manufacturers, and the uses they have made of science and invention in new industries and the development of old.

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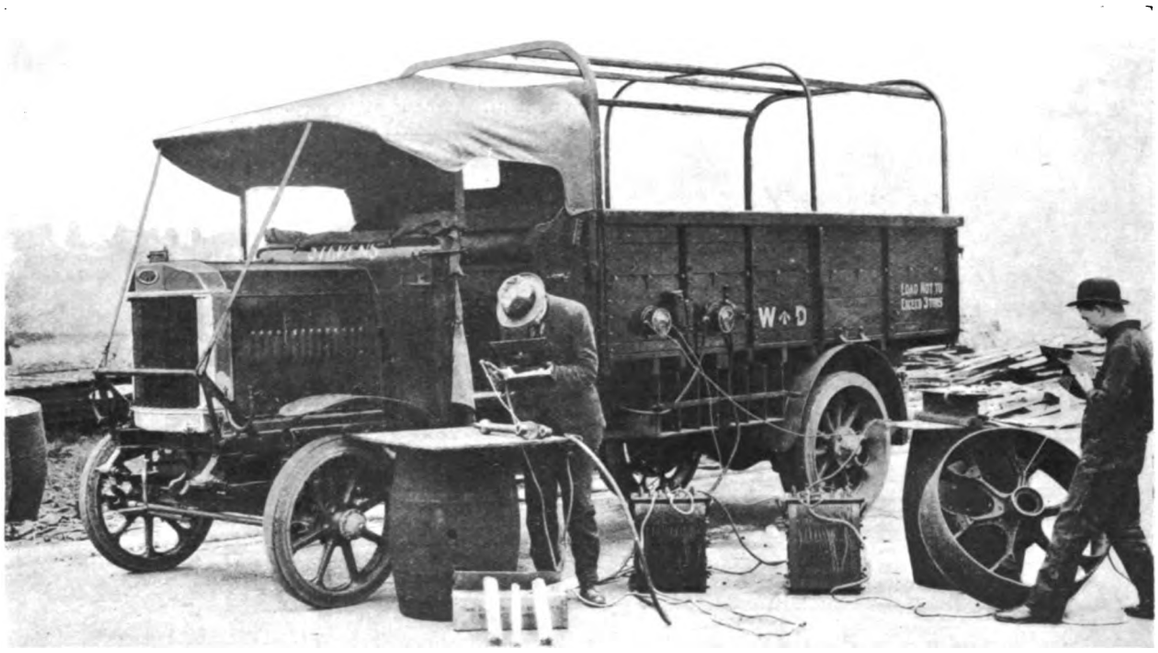
"STEVENS" MOBILE ELECTRIC WELDING PLANT.

As briefly noted in our issue of May 15, an interesting demonstration of the "Stevens" machine as a mobile electric welding plant was given by Stevens Petrol-Electric Vehicles, Limited, of which company Mr. W. A. Stevens is managing director. The demonstration took place at the works of Messrs. Dennis Brothers, at Guildford, and covered a wide variety of operations, all of which were carried out very successfully and with remarkable rapidity. As is now generally recognised, the superiority of electric welding, when compared with other methods, is due to the fact that the heat generated by the electric arc is extremely local, thereby resulting in a much smaller area of disturbance, and also by reason of the elimination of the necessity for any pre-heating of the work to be welded.

For the demonstration a standard 3-ton "Stevens" petrol-electric War Office subvention type vehicle was used. The system of welding was the Quasi-Arc process, which in normal working calls for a terminal pressure of not less than 90 volts nor more than 115 volts. As a matter of fact, throughout the whole course of this demonstration a steady pressure of about 105 volts was maintained, and much of the success of the various operations was due to the evenness of the pressure. The accompanying illustration shows the machine at work supplying current to two separate welding outfits working simultaneously. In each case the company's B3 resistance is being used to adjust the current for the particular size of electrode in use, and the nature of the work being carried out. As the high pressure specified is only required intermittently, in order to overcome the resistance offered by the unvolatilised slag with which the electrodes are covered, the Quasi-Arc Company has recently designed and patented a reactance coil by means of which it has been found possible to work satisfactorily on a direct current supply of 60 volts. The importance of this development can be appreciated by the fact that with one of the "Stevens" standard lorries three welding equipments can be run at the same time, each working independently. At the actual demonstration, with the new reactance coil which in practice boosts up the voltage as required whilst the welding is in progress—the generator of the vehicle was set for an output at 60 volts, and a perfectly steady flow of current was maintained at this voltage, although different sizes of electrodes were used without any attention from the driver of the vehicle whatever. As the vehicle can carry a large amount of tackle and tools, in addition to the three welding equipments, it will be seen that a wide field of usefulness in the traction and general engineering industry is open to the "Stevens" mobile welding plant, especially where a suitable supply of current is not otherwise obtainable.



LONDON OMNIBUSES AND ROADS.

A movement has been started among the local authorities of London for obtaining payment of a contribution towards road maintenance from the omnibus companies.

Westminster Corporation were the first to put forward the suggestion, following a letter from the London General Company suggesting the restoration of a service that had been taken off during the war. The reply of the Works Committee set forth the inadequacy of existing services, the discomfort caused by the carrying inside of five standing passengers, and the insufficiency of the inside seating for eight persons on each side. Finally, the Committee suggested that the company should pay a nominal sum in relief of rates in respect of maintenance of the roadways. To this suggestion the company replied that they could not entertain it, as the amount already paid in the form of petrol duty to the Road Board is a very heavy charge on their revenue.

Lambeth Council have adopted a similar suggestion after a discussion which was taken part in by Councillor J. Mitchell, the Comptroller of the Underground and Omnibus Group, who maintained that the undertaking was already sufficiently taxed in that the petrol duty was levied for the purpose of road maintenance.

Camberwell Council have passed a resolution urging the Government to appoint a Commission to inquire into the increased fares and also the working and management of the London General Company "with a view to providing out of their revenue a direct contribution towards the upkeep of the roads, and to limit arbitrary and unnecessary increases of fares."

Meanwhile none of the criticising Councils have given the omnibus undertakings credit for the fact that their fare increases are not so great as those of the County Council Tramways, and that it is possible by using an omnibus to save a penny on the charges made by the tramways.

MOTOR CARS FROM AMERICA.

In the House of Commons on May 26, Sir A. Geddes informed Colonel Herbert that in April British firms were notified that until September 1 they will be allowed to import American motor cars to the extent of 50 per cent. of their 1913 imports divided into twelve monthly instalments. Colonel Herbert inquired whether, in view of the demands of business in this country, it was not possible to allow a larger importation. Sir Auckland Geddes replied, "The ration was fixed by the Imports Consultative Council. I do not propose to alter the decision."

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ROADS AND TRANSPORT EXHIBITION.

The County Councils Association has decided to organise a Roads and Transport Congress and Exhibition at the Royal Agricultural Hall, London, in November of this year. The arrangements will to a large extent follow the lines of the successful Roads Congress and Exhibition organised by the association in 1915, but in view of the important developments in regard to transport, it has been decided on the forthcoming occasion to pay special attention also to this branch of the road problem. The organising secretary of the congress is Mr. S. M. Johnson, the secretary of the County Councils Association, and the exhibition will be under the management of Mr. A. F. May, the managing director of the Municipal Agency, Limited, 13, Victoria Street, S.W.

Arrangements are being made with a view to securing the attendance of representatives of the home Government and the Governments of all the British Dominions, while invitations are also being extended to the various local authorities and to all professional and commercial bodies and societies connected with the administration and user of the roads.

MODERN STREET CLEANSING METHODS.

REPORT OF A GLASGOW CORPORATION DEPUTATION.

In view of the importance of the cleansing department being provided with the most up-to-date haulage plant and appliances for cleansing purposes, Glasgow Corporation appointed a deputation to inspect the haulage plant and appliances in operation in London, Birmingham, and Sheffield, and as a result the cleansing committee propose the purchase of—

(a) Eight additional 2-ton electric vehicles, the cost of which, excluding the bodies, which will be built at the department workshops, is estimated at £8,000;

(b) Five motor street-sweeping machines at £525 each; and

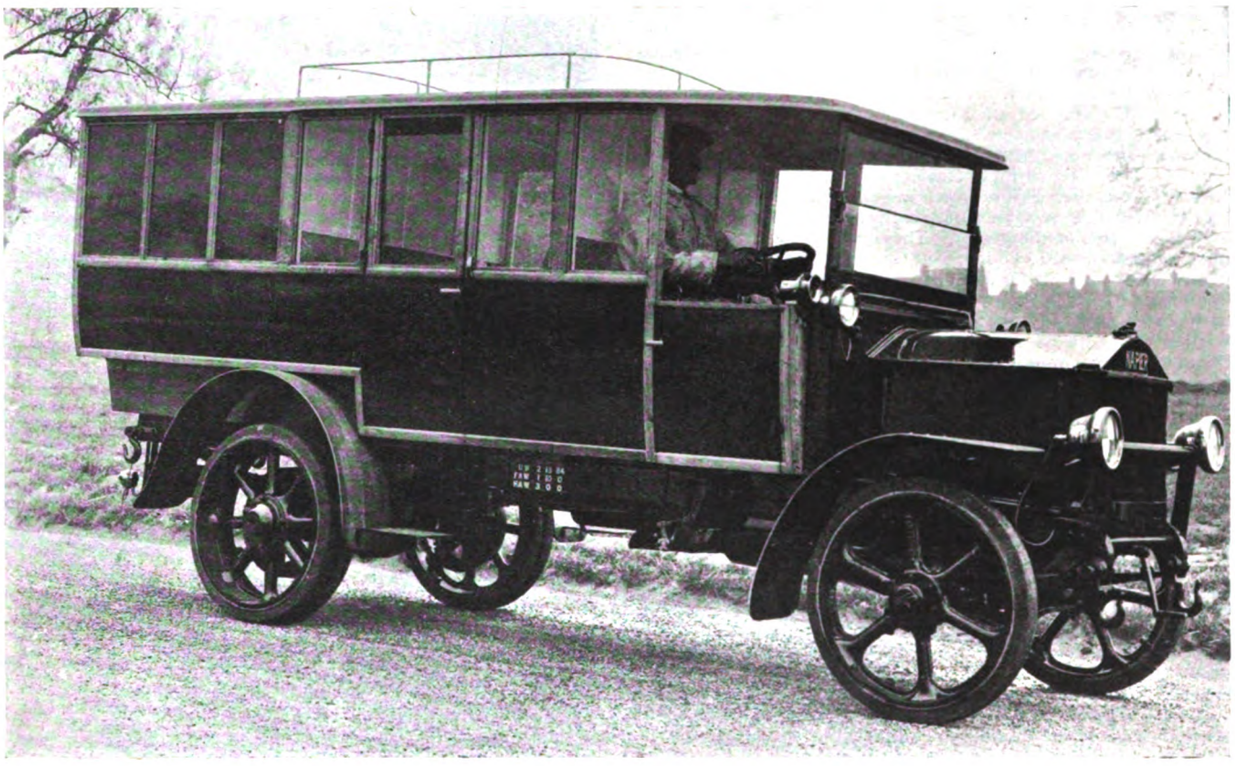
(c) One Pioneer sweeping and loading machine at £360.

Subjoined is the report of the deputation:—

The deputation had long interviews with the makers of electric refuse removal vehicles. There has been no material alteration so far in the type of vehicles, except that the later types have a loading line which is a little lower than the machines at present in use. The latter have been very successful and economical, and the committee recommend the purchase of eight additional 2-ton electric vehicles to cope with the work during the coming winter. By doing so, the purchase of sixteen additional horses will be rendered unnecessary.

When interviewing the representatives of the Edison Accumulator Company, the question of the non-delivery of the two 3½-ton vehicles, which had been on order since July last year, was discussed. There is still no absolute guarantee as to when these would be delivered, and it was suggested that two 2-tonners at the same price as those last delivered should be substituted in lieu thereof. The deputation recommend that this arrangement be carried out. The probable cost of the eight wagons already referred to, excluding the bodies, which will be built at the department's workshops, is £8,000.

The works of the Lacre Motor Company at Letchworth were visited and an inspection made of their new type of motor sweeping machine. The machine, which had been hurriedly completed in view of the inspection, gave a demonstration on the road outside the works, where it performed satisfactorily. The machine has been specially made for the purpose of street sweeping, and the designer has corrected the mistakes of the past. It is lightly built,



A Napier Business Vehicle of a Novel Pattern.

NAPIER BUSINESS VEHICLE.

The accompanying photograph shows a recent type of a Napier business vehicle, fitted with rather a novel type of body. This body has been built specially for Mr. Lionel de Rothschild, and is composed of three compartments, one for the driver, one for servants, and the third for the accommodation of luggage. The vehicle has also been constructed for station work and for shooting parties, when it would have to traverse rough surfaces, requiring a chassis of particular strength and flexibility. The Napier has been chosen by Mr. Lionel de Rothschild because of its wonderful record during the war, and the satisfaction he has received from the six-cylinder Napiers he has purchased from the company.

OVER £2,000 FOR A SECOND-HAND CHARS-A-BANC.—At Elland, in Yorkshire, on May 29, a Leyland chassis, fitted with an ordinary 28-seated chars-a-banc body, fetched a sum of no less than 2,170 guineas. The chassis price of this identical machine when it left the works in February last was £945.

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and there is therefore every reason to expect a considerable increase in the mileage to the gallon of petrol. The designer informed the deputation that there were 200 less parts in the new machine as compared with the former production.

Attention has been paid to rendering the machine easy of inspection, and for the removal of parts for any necessary repairs.

An important new feature of the machine is that it will sweep a width of 6 ft. 6 in., as compared with 5 ft. 3 in. by the present Lacre sweepers. The price of the new type of vehicle is £525.

A discussion took place with the representatives of the firm regarding the substitution in part payment of the machines owned by the department of this company's make, which have been in use for about four years. The firm agreed to take back these old machines in part-payment for any of the new types which may be ordered. There are five old machines. The deputation recommend the purchase of five new machines one old machine being accepted in part-payment of each new one ordered.

The surveyor of St. Marylebone Borough Council was good enough to give the deputation a demonstration of the street gully cleaner made by the Straker-Squire Company, Limited, the representatives of the company being present. The machine performed the work satisfactorily, but the silt in the gullies had to be constantly stirred by an attendant and water added from time to time to keep it in a liquid state. The addition of the water for the purpose referred to, and also for filling the gulley after it had been cleaned, necessitated the presence of a water-cart. A further weakness is that the gullies, being completely emptied of their contents direct into the tank a considerable quantity of water, which had to be conveyed to the depot, where additional labour and time is incurred in draining off the liquid. The effect of these services obviously runs up the cost of the work. Another feature which was present here - and favourable to the machine as against manual labour for this work -was the depth and area of the gullies. These were very large, and not at all of the same type to be found in Glasgow, where they are very small and not so suitable for economical work by mechanical means. On the score of cost, however, the deputation find that the work is much more economically overtaken by the present method. The deputation therefore do not recommend the introduction of this machine for gully emptying in Glasgow. It should be borne in mind that the apparently insanitary effect of the Glasgow method in leaving the contents of the gullies lying on the street opposite the grating until the water drains off is greatly minimised by the fact that almost the whole of this class of work is executed either during the night or in the early morning.

A demonstration was also given of a street washing machine made by the same firm. The method here was to flush the surface of the street with water under pressure from the machine, with the addition of rubber "squeegees" to remove the loosened grit from the surface of the thoroughfare. The deputation were not satisfied that the machine had done its work effectively, and were convinced that the condition of the streets in Glasgow would tend to give more unsatisfactory results than those witnessed by the deputation. Accordingly, the acquisition of a machine of this description is not recommended.

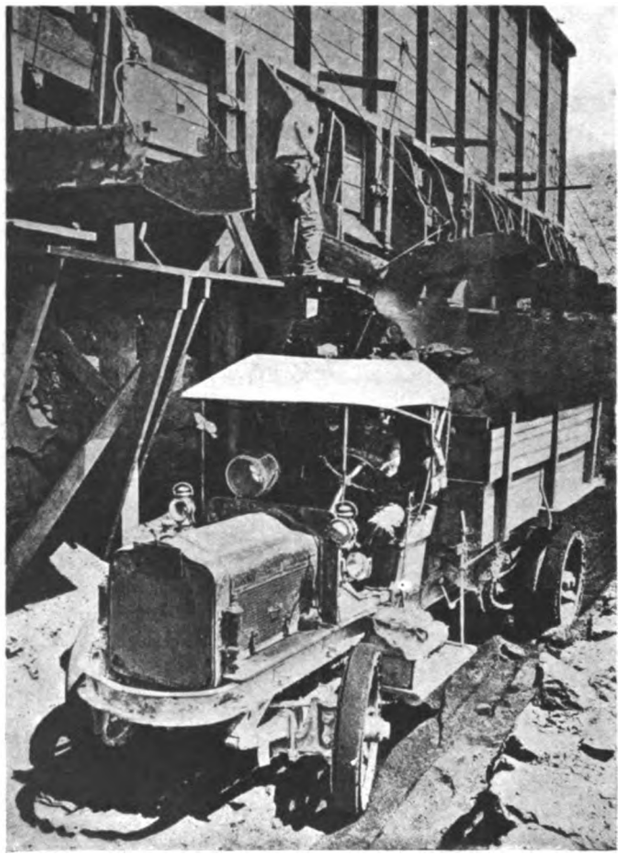
The chief road surveyor of Birmingham arranged for a demonstration of the "Pioneer" sweeping and loading machine on a street which had been specially left uncleansed for the purpose. The test was an exceedingly severe one, the crop of dirt upon the surface of the roadway being abnormal. The machine performed its work satisfactorily. It was highly spoken of by the officials in charge, and reassuring replies were given to questions by the deputation as to number of days at work per annum and repairs. The machine can be attached by a draw-bar to a wagon of any capacity, but possessing sufficient power to maintain the travelling speed of the whole equipment—wagon and "Pioneer"—at a rate of about five miles per hour. It consists of a strong frame containing a brush fitted at the extreme rear. The dirt swept by the brush is taken up by two helical scrolls working in opposite directions, which pass the refuse towards the centre of the machine and load it at the boot of the elevator, from which it is taken up by specially constructed buckets on endless chains to the elevator and deposited in the wagon.

The power to drive the brush and elevator is derived from two sprocket wheels on the main axle, both of which are fitted with throw-out gear. One sprocket drives the brush of the machine and the other the elevator, from the lower spindle of which the power is obtained for driving the scroll axle.

The deputation are satisfied that considerable economy can be effected in loading the street sweepings by such a machine, and recommend that one might be purchased in the meantime. The probable cost is about £300. This obviously does not refer to the wagon, which can be of general use, and it is proposed in the first trials of the machine to utilise one of the petrol motor wagons at present owned by the department.

NEVADA MINE MOTOR SERVICE.

About 17 miles from Las Vegas, Nevada, U.S.A., large deposits of invaluable manganese ore were struck last year, but transport of the ore to the nearest railway line seemed to present almost insurmountable difficulties. Construction of a railway, even if it had been feasible in ordinary times, would have been too costly, and in war time was a simple impossibility. At this juncture the management of the mines hit upon the happy expedient of using motor trucks for transporting the ore, and the adventure was a great success. Great 5-ton White motor trucks were employed experimentally at first, and latterly a fleet of twelve, with trailers, was kept constantly in service day and night, the motors being equipped with searchlights for the night work. At the mine end giant overhead hoppers, such as are commonly used by contractors



Nevada Mine Motor Service.

in excavation work, were used, and fitted with chutes by means of which the ore was loaded by gravity into the trucks' bodies and trailers. One of the hoppers and a truck in the act of being loaded are shown in the accompanying illustration, for which we are indebted to the *Commercial Vehicle*.

THE NEW OMNIBUS FOR LONDON.

In the House of Commons on May 20, Mr. J. D. Gilbert asked the Home Secretary if the Chief Commissioner of Police is requiring a new type and standard of omnibus for the Metropolitan area before he will license same; and in what manner the new standard varies from existing types, licensed as to weight, build, passenger-carrying capacity, and other important features? Sir H. Greenwood, in reply, stated that the Commissioner had urged the desirability of designing a lighter type of omnibus, or alternatively of improving the springing, but did not suggest any variation as to existing dimensions or as to the number of passengers.

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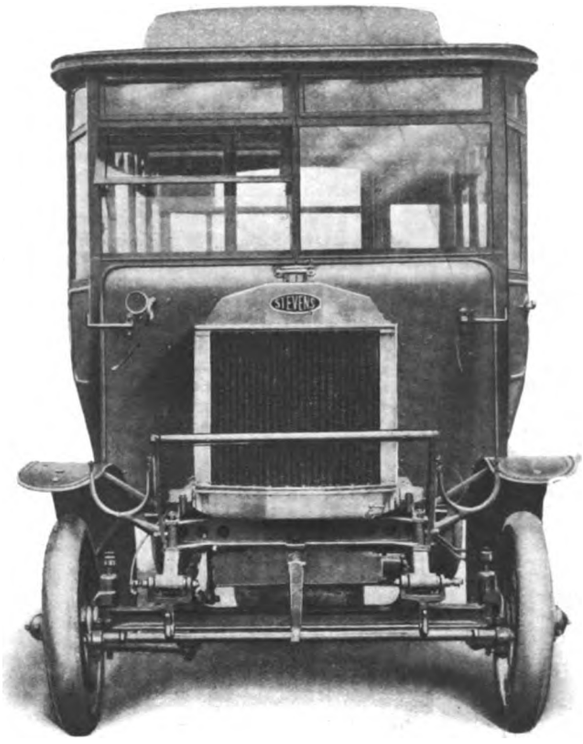
STEVENS PETROL-ELECTRIC OMNIBUSES AT WALSALL.

The single-deck omnibus illustrated on this page is one of four which are being supplied by Stevens Petrol-Electric Vehicles, Limited, of 82, Victoria Street, Westminster, to the order of the



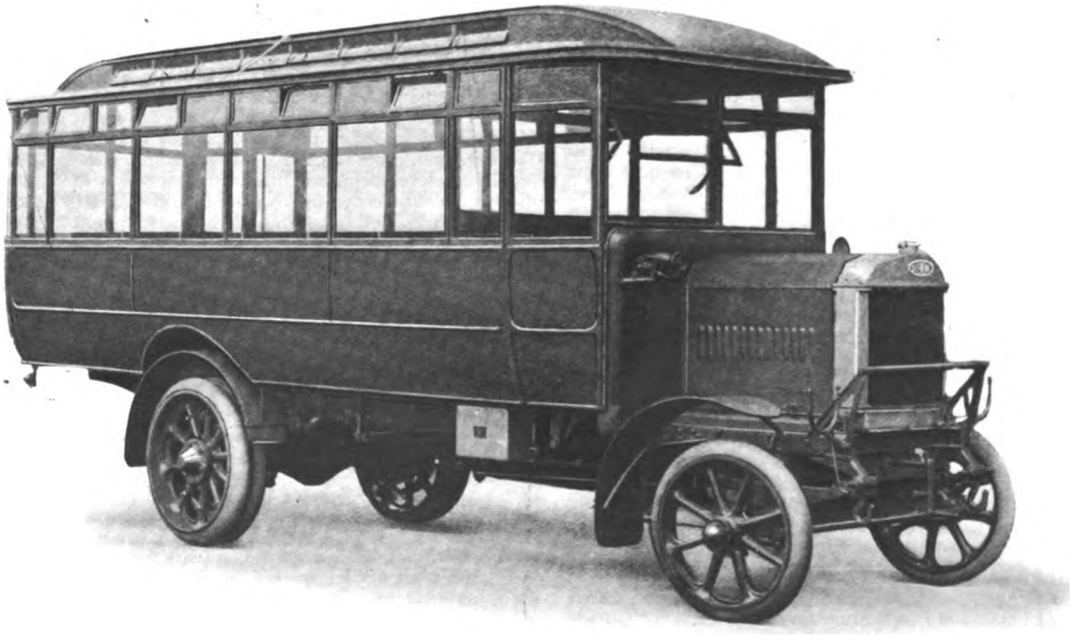
Walsall Corporation. The chassis is the Stevens "A" subsidy type, which was fully described in THE TRAMWAY AND RAILWAY WORLD for January 16 last, and is exactly similar to those which have been delivered in large numbers to the War Department. Owing to the extreme flexibility of the electric transmission, and the remarkable simplicity of the control, these machines are specially suitable for passenger work, and the two omnibuses already in service have created a very favourable impression both with the travelling public and the officials at Walsall.

The single-deck body was built by Christopher Dodson, Limited, of Cobbold Road, Willesden Green, N.W., and is their standard type single-deck. As will be seen from the illustration, it is of handsome appearance, while the clerestory roof gives ample ventilation as well as more headroom in the interior. There are seats for 26 passengers in the inside compartment, arranged on thirteen cross seats, and three on the driver's seat, giving a seating capacity for 29 passengers and the driver. The front of the body is fully enclosed, the entrance to the interior being at the side of the rear end. The inside seats have special flexible backs, the backboard being carried on a flexible steel plate, giving comfort in riding and at the same time reducing considerably the thickness of the backs, and so effecting economy of space in the length of the body. A feature worthy of notice is the method of fixing the body to the chassis. This is done by means of the builders' patent crossbars, which also support the side of the body laterally, and thus prevent any tendency to sag. This type of body has now been standardised by Messrs. Dodson's. The C.A.V. electric lighting equipment gives ample illumination for the interior as well as for the head and tail lights.

KEMPTON PARK AND SLOUGH.

During the past few weeks vehicles from Kempton Park Racecourse have been included for sale at the auctions held by order of the Disposal Board of the Ministry of Munitions. A large number requiring repairs have been towed to the depot at Slough to undergo renovation prior to sale. For several weeks in May the Parliamentary Committee appointed to investigate the circumstances under which the War Office started the Slough scheme have held sittings, at which evidence was given on behalf of the War Department, and also of the motor manufacturers' offer in regard to repairing vehicles. From an answer to a question put in the House of Commons, it appears that at the date of the Armistice there were 16,931 vehicles at Kempton Park, and early in May the number of derelicts had been reduced to 13,177.

PRICE OF AN AMBULANCE CAR. At a recent sale of war motor vehicles a 16-20 H.P. ambulance, presented to the Royal Navy by the United Province of India War Fund, realised 240 guineas.



Stevens Petrol Electric Omnibus—Walsall Corporation Tramways.

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LONDON TRAFFIC CONGESTION.

PARLIAMENTARY COMMITTEE APPOINTED BY GOVERNMENT.

Early in May the congestion of London passenger traffic, combined with the increase in fares all round, had caused such a ferment in the public mind that the call for some remedy became urgent. London Members of Parliament formed themselves into a Committee of Inquiry, and, as reported in our issue of May 15, heard evidence from Mr. Pick, commercial manager of the London General Omnibus Company, on May 5, and appointed a deputation of their number to approach the Board of Trade and the Local Government Board, urging the Government to take steps to mitigate the bad conditions existing throughout the whole metropolitan area.

EVIDENCE OF LONDON TRAFFIC MANAGERS.

Continuing their investigations on May 12, the committee of London M.P.'s took evidence volunteered by representatives of the London County Council Tramways and the Metropolitan Railway at the committee's invitation. In reply to questions, Mr. Squires, chairman of the London County Council Highways Committee, stated that the number of passengers carried on the Council's cars last year was over 636 millions, an increase of 224 millions over the total for the year 1908-9. In 1913-14 the working expenses were 6½d. per car-mile, and for 1919-20 they were estimated at 1s. 4d. per car-mile.

In a written statement, Mr. A. L. C. Fell, general manager of the London County Council Tramways Department, dealt with increased fares and overcrowding. The average increase on fares, as between 1913-14 and 1918-19 was 30 per cent., which compared favourably with the 50 per cent. addition made on railway fares. The main causes of overcrowding were increase in the number of passengers travelling and reduction in the number of cars available. Replying to Sir William Bull, Mr. Fell said that, by running omnibuses as the Council desired to do, they would be able to charge a cheaper through fare. In answer to Mr. Hopkins, Mr. Fell stated that approximately one-third of the increased cost per car-mile was due to labour.

Mr. R. H. Selby, general manager of the Metropolitan Railway, also gave evidence. As quickly as possible the service on the Metropolitan lines was being accelerated. In their new experimental train there would be five doors to a carriage, so that the passengers would be able to "unload themselves instantly." The new cars would seat 58 passengers. Mr. Selby stated, however, that until they knew the policy of the Government in regard to railways, it was considered imprudent to place large orders for new rolling stock.

LONDON COUNTY COUNCIL HIGHWAYS COMMITTEE EXAMINED.

During the week following the movement gathered force, agitation being specially directed against the increased fares charged on tramcars and omnibuses. Again, on May 22, South London M.P.'s invited the Highways Committee of the London County Council to meet them at the House of Commons, in order that the question of fares might be discussed. In a written statement Mr. Squires, chairman of the Highways Committee, stated the case for the Council. In framing the new fares, he said, the Council had limited the increases to the absolute necessities of the situation. In order that the tramways should pay their way, it would be necessary to raise over £1,000,000 more revenue. Even the increased workmen's fares would entail a loss of £105,000 per annum. It had been suggested that in most cases penny fares had been doubled, and that in some cases 2d. was charged for a distance of three-quarters of a mile. The answer to this was that the average distance now offered for 1d. is 1·48 miles against the previous distance of 1·8 miles. It should also be pointed out that only one-fourth of the passengers paying penny fares are affected by the recent changes. Mr. Squires contended that the tram fares were lower than those charged by the omnibus companies. The sole object of revising the fares had been to balance revenue with expenditure, and so prevent the L.C.C. tramway undertaking from becoming a charge on the rates.

Sharp criticism followed Mr. Squires' statement, Mr. J. D. Gilbert and Mr. Lane Mitchell giving instances justifying serious complaint. Mr. Fell replied that the stages had been very unequal, and that in the past many passengers had got cheaper fares than they were entitled to. At the close of the proceedings, Mr. Squires asked for a little patience on the part of the public.

DEPUTATION TO PRESIDENT OF THE BOARD OF TRADE.

Sir Auckland Geddes, on May 23, met the deputation appointed at the meeting of London M.P.'s held on May 12. Mr. J. D. Gilbert explained that London Members were being assailed by their constituents over the crowding of tubes, omnibuses, and tramcars, and the increased fares. Overcrowding had been further increased by the closing of stations, which threw more work on the tubes, tramways, and omnibuses, while the increase in season ticket rates was a serious item in the budgets of thousands of families.

In pre-war times the railway companies invited people to live in the suburbs, and the increase on "seasons" was extremely hard in those cases. They had interviewed representatives of the traffic combine and the cab interests. The explanation given was that they were unable to obtain supplies of material for repairs and new rolling stock in order to increase the services. The deputation urged that the Government should allow the import of repair parts in much greater quantity than now, and also to appoint a Select Committee to consider the question of London traffic.

Mr. Higham urged that the Government should give immediate consideration to the appointment of a permanent Commission, similar to the Public Service Commission in America, to regulate fares and see that a satisfactory service was constantly supplied to the public.

Mr. Clement Edwards, referring to the increase in season ticket prices, declared that it was a monstrous thing to penalise City workers by what was a purely war measure. He added that the traffic combine had refused an offer made by the War Office to bring chassis from France for the purpose of increasing the number of omnibuses on the London roads. The Government had a right to say that as a condition of the licence which the combine held from the community they should do something to meet the demand by availing themselves of the offer which had been made.

Major Archer-Shee said that there were 2,100 chassis which could be released as a temporary expedient, and rigged up as single-decked omnibuses.

SIR AUCKLAND GEDDES' REPLY.

Sir Auckland Geddes, in replying, said with reference to the statement that repairs were being held up because spare parts could not be imported, it was true that licences were required, but they were granted freely so far as spare parts for the repair of vehicles already on the road were concerned. He pointed out that there had been considerable difficulty in getting raw material for some of the repairs. This applied to some types of wood, while there was an enormous shortage of steel, and an overwhelming demand arising in no small measure from the huge demand made upon the railway and tramway rolling stock. Orders were booked up for many months to come. With regard to the statement that chassis had been refused from France, Sir Auckland said that the company had written to say that there had been some mistake in regard to the statement. He added that 116 motor lorries had been converted into omnibuses, and were either now on the streets or would be shortly. There were also under construction for the omnibus company 250 new omnibuses. With reference to the suggestion that more lorries should be run to augment the omnibus services, Sir Auckland Geddes pointed out that this would mean an alteration of the law. As to fares, he said that the increases were directly due to the increased cost of running. The alteration of conditions, the shortening of hours, etc., granted to railwaymen, although desirable, had come at the most awkward time they could possibly come, and the problem was a serious one which was hampering traffic services throughout the country. There was a greater accumulation of workers than before the war at a time when facilities were fewer. The managerial staffs of the railway companies had an appalling problem before them, and the country owed a great deal more to them than was generally recognised. He declared that while he certainly would not do anything to resist the appointment of a Select Committee, he did not feel at the moment that a Select Committee would help them very much. He promised the deputation that he would undertake to see that the matters they had placed before him were not allowed to drop, but would be pushed forward, and he would be very pleased to meet them in a few weeks' time to inform them what had been done. He thought a Select Committee would not lead them as rapidly forward as it was possible to move without one.

SELECT COMMITTEE PROMISED.

The agitation continued, and in the House of Commons, on May 26, Mr. Kennedy Jones asked the Leader of the House whether his attention had been called to the practically unanimous wish of the London and Greater London Members, representative of all parties, that a Select Committee should be at once appointed to investigate the grave congestion of the existing means of transport in the Metropolitan area, together with the persistent increase in fares, and with a view to recommendations being made for immediate improvement, either by way of legislation or otherwise. Mr. Bonar Law: Yes; I have discussed this matter with the Ministers concerned, and I hope that the work of a Select Committee on this subject will be useful. We propose therefore to set it up immediately.

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Sir A. Geddes, in answer to Mr. Higham (Co. U., Islington, South), said the possibility of using Government lorries on the streets of London in order to relieve the overcrowding of omnibuses and tramways was being examined this week. Colonel Gibbs (Co. U., Bristol West), replying to a question addressed to the Prime Minister, informed Mr. Higham that if the investigation which was now proceeding showed that the fares charged by the London General Omnibus Company were excessive, he would consider what should be done. He hoped, however, that legislation would not be necessary.

CONSTITUTION OF SELECT COMMITTEE.

On Wednesday, May 28, it was stated that the Parliamentary Committee of Inquiry appointed by the Government to inquire into London traffic conditions would consist of the following:—Sir Frederick Hall, Colonel Assheton Pownall, Mr. Lane Mitchell, Mr. Kennedy Jones, Colonel Sir M. Archer-Shee, Mr. G. Balfour, Mr. Clement Edwards, Mr. J. D. Gilbert, Mr. C. F. Higham, Mr. Foreman, Mr. C. W. Bowerman, Mr. John Jones, Mr. Newbould, Sir R. Park Goff, and Major Joseph Nall.

At the same time it was intimated that the Government had decided to use War Department lorries to relieve the pressure on the tramways and omnibuses in the Metropolitan area. The first lorries would be run in connection with the services of the London General Omnibus Company. No seats were placed in the lorries used during the tube strike, but the vehicles would be fitted with chairs in order to make passengers as comfortable as possible. The lorries would be driven by drivers of the London General Omnibus Company, and would first be used as feeders in outlying districts.

OPENING OF ENQUIRY.

WITNESSES EXAMINED BY SELECT COMMITTEE.

The Select Committee met for the first time on Thursday, June 5, Mr. Kennedy Jones, M.P., presiding. The Superintendent of the Public Vehicles Department, Scotland Yard, Mr. Arthur Bassom, gave the number of motor omnibuses licensed on December 31 last as 2,277. In 1914 the number was 3,057. During last year 162 new omnibuses were licensed, and from January 1 to May 31 last 1,325 omnibuses, including several which had been renovated, were licensed. There was greater congestion in the wider than in the narrower streets, as the latter contributed to the more even flow of traffic. Omnibuses were restricted to a speed of 12 miles an hour, and while it might lessen congestion if they were permitted to travel at a rate of 15 miles, he believed that that would greatly increase the danger of the streets. The conditions arising out of the war had caused an increase in street accidents, although the number in the past year showed a decrease over the previous year. There were many difficulties in the way of using the queue system. He believed that an order empowering the police to regulate the routes on the shorter stretches would lessen the congestion considerably. Plans for a new type of taxi-cab have recently been approved by Scotland Yard, and when the manufacturers start to turn them out they will do so at the rate of 200 cabs a week.

Sir William Marwood, of the Board of Trade, gave evidence as to the powers of his department in relation to railways and tramways, and said that he believed the District Railway were running all the trains they could during the rush hours. There were 40 trains an hour, and he did not think it was possible to go beyond that. The rolling stock position was difficult. Some of the stock now in use ought to be in the repair shop. He did not think the Board of Trade would be hostile to the suggestion that there should be some overruling, unifying authority for the whole of the traffic of London. He thought it might be to the good if there was a traffic authority having complete control over omnibuses, queues, and tramways. There was a greater number of people travelling than ever before. The traffic had outgrown the facilities in an extraordinary way. The Board of Trade had no powers to deal with overcrowding.

THE ELECTRICAL VEHICLE COMMITTEE.

Mr. R. A. Chattock, who has been chairman of the Electric Vehicle Committee of Great Britain since its formation in 1913, has been compelled, owing to pressure of other work, to resign the position. At the meeting of the committee, held on May 9, Mr. Chattock's resignation was received with regret, and a resolution was passed thanking him for his services. The hon. secretary, Mr. F. Ayton was elected chairman for the year ending March 31, 1920. Mr. Shrapnell-Smith was re-elected vice-chairman, and Mr. J. Christie hon. treasurer. Mr. Ayton will continue to hold the position of hon. secretary. A Special Committee to investigate the question of the most suitable quality of rubber to employ for solid tires for electric vehicles has been appointed jointly by the Electric Vehicle Committee and the British Association of Rubber Tyre Manufacturers.

The committee's publication, *The Electric Vehicle*, will appear monthly, commencing with the June issue.

PETROL OF INFERIOR QUALITY.

Complaints have been made in the House of Commons of the inferior quality of the petrol now being sold to motorists. Mr. Bridgeman, in reply, said that the price of petroleum products had been so fixed as to balance as nearly as may be the cost to the Government after allowing for freight payments. All importations of petrol up to January 31 were on Government account, and the qualities imported were of the standard U.S. specification. The petroleum companies since that date have been free to import on their own account, and the sale of petrol is in their hands.

DRIVERS AS OMNIBUS OWNERS.

The organisation which has for some years enabled a number of drivers of motor cabs in London to become the owners of those vehicles has been extended with a view to afford facilities to omnibus drivers to become owners. The new venture will be known as the Motor Omnibus Co-operative Society, Limited, and membership will be restricted to the members of the London and Provincial Vehicle Workers' Union.

As the vehicles will weigh only about 30 cwt., they will be fitted with pneumatic tires, thus enabling the ordinary motor car speed of 20 miles per hour to be attained. It is stated that there will be accommodation for 26 passengers, as against seats for 34 provided on the existing double-deck omnibus.

ELECTRIC COMMERCIAL VEHICLES.

The paper read by Mr. Frank Ayton, honorary secretary of the Electric Vehicle Committee of Great Britain, and general manager and electrical engineer of Ipswich Corporation Tramways, on "The Electric Automobile for Commercial Use," at the Royal Automobile Club on May 14, was an interesting *résumé* of the present position of the electric vehicle. It briefly described the development in America, and gave at greater length an account of the progress made in this country. Mr. Ayton thinks that a careful consideration of the characteristics of the commercial electric must lead to the conclusion that its main field and application lies in substitution for horse haulage. It does not and cannot compete with the petrol vehicle where the latter is employed upon the work for which it is so well suited, viz., long distance haulage and express service. In reply to a discussion, Mr. Ayton admitted that his chief interest in electric vehicles was that the charging of batteries during the night would be profitable business for electricity supply stations. On the other hand, a number of the members of the Electric Vehicle Committee were thoroughly convinced of the great value of electric vehicles within certain limits.

NEW MOTOR TRADING COMPANY.

ORDERS FOR £1,000,000 WORTH OF CARS.

To the surprise of financiers and of the trade in some quarters it was announced on May 14 that there had been an over subscription to the first share issue at par of one million £1 shares in the newly-formed British Motor Trading Corporation, Limited. According to the prospectus the directors and their friends applied for over £600,000 of the capital.

This undertaking has been formed for (amongst other purposes) purchasing cars and commercial vehicles for individual and company users, and it is stated that the orders already placed with one company embrace £1,000,000 worth of cars. The prospectus stated that contracts had been made to take over from Crossley Motors, Limited, and from Straker-Squire, Limited, selling contracts for London and considerable areas of the country, and that negotiations are in progress with manufacturers for further important contracts, not only for the British Isles but also for export.

The company has been formed under the auspices of the Motor Union Insurance Company, and among the directors of the two bodies is Mr. Rees Jeffreys, the late secretary of the Road Board, who was formerly secretary of the Motor Union. The Motor Trading Corporation assert that their policy of placing large contracts will enable manufacturers to increase output and dispose of it at lower prices, and that the decrease in price should leave a considerable margin of profit to the Corporation after guaranteeing his return to the manufacturer and conferring substantial benefits upon the user. The Corporation also propose to create a widespread organisation for the repair, maintenance, letting on hire, and garaging of cars, commercial vehicles, and agricultural motor machinery.

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PUBLIC CARRIAGE RED TAPE.

CHARGE AGAINST SCOTLAND YARD.

At the sitting of the London Members' Traffic Committee held on May 20 at the House of Commons, Mr. A. Smith, president of the Union of Licensed Vehicle Workers, said there were about 1,000 demobilised cab drivers who were unable, through a shortage of cabs, to return to their employment. Between 400 and 500 cabs could be put on the streets almost immediately if the police would license those with a 9-in. clearance. The 10-in. clearance was considered by the police sufficient to save the life of a person who might be knocked down by a taxi-cab. Several members of the committee remarked that such a clearance would be of no good in their cases.

Two demobilised drivers stated that the axle business was camouflage and a foolish restriction. They were up against red tape and nothing else. There were no restrictions on private cars. One witness complained of the tests required for different types of cabs. Drivers were going to be financed to enable them to buy the cabs if only they were allowed to use them.

Mr. R. C. Nesbitt, solicitor, said that 3,000 cabs had been deteriorating in the garages of the London Motor Cab Company since January, 1918, because the Home Secretary refused to sanction the shilling-a-mile fare. In the previous year the company had lost £70,000, and when the Home Secretary refused to grant the shilling a mile the directors felt they could not go on losing money. They were now ready to sell the cabs to the drivers. In 1914 the number of cabs in London was 9,000; to-day it was about 3,000.

The chairman of the committee undertook to place the points raised before the Home Secretary.

At a meeting of demobilised men held on May 16 under the auspices of the Licensed Vehicle Workers' Union, the Government were urged to allow chassis and spare parts to be imported. It was stated that the derelict cars at Kempton Park would furnish sufficient spare parts to enable an adequate number of cabs to be fitted up to provide work for demobilised cabmen.

ENGINEERS AND ROAD REFORM.

For many years the motoring organisations and the Roads Improvement Association have agitated to secure alterations in the general law governing the public highways on the lines now recommended to the Institution of Municipal and County Engineers by their Roads and Tramways Committee.

In presenting their recommendations the committee remark upon their importance in view of the part which good roads play in the well-being of the nation. In regard to breaking up roads for the purpose of laying mains, cables, drains, etc., it is suggested that the present regulations should be superseded, and that all statutory undertakings should be brought under a new Act, the chief provisions of which are set forth.

On the question of the compulsory acquirement of land for the purposes of new highways and for widenings and improvements, the committee suggest the granting of more extended powers such as are embodied in the special Acts in force in Birmingham, Liverpool, Sheffield, Swansea, and other large towns.

Special powers are suggested to enable highway authorities to prevent the formation of dangerous corners, for the purpose of improving existing dangerous corners, and securing the removal and pruning of trees, hedges, and other obstructions.

Finally, the committee recommend amendment of the law of extraordinary traffic, but as the County Councils' Association are dealing with this question they make no definite recommendations.

FARNBOROUGH OMNIBUS FARES.

In consequence of working costs having risen 150 or 200 per cent., the Aldershot and District Traction Company recently advanced the fares on their motor omnibuses between 33 and 50 per cent. One result was that Farnborough Council refused to renew the licences unless fares were lowered, and since May 23 the vehicles have refused to take up passengers in Farnborough except at inconvenient points on private land of the railway company and the military authorities. Indignation has been created among the public by the action of the Council, and the company have decided to apply for a mandamus calling on the Council to show cause for refusal of the licences.

MOTOR VEHICLES FOR MUNICIPALITIES.

GUISBOROUGH RURAL COUNCIL are obtaining a steam lorry.

KIDDERMINSTER RURAL COUNCIL contemplate purchasing a lorry

STOCKPORT CORPORATION have decided to obtain two omnibuses.

PETERSFIELD COUNCIL contemplate providing a motor fire engine.

OLDHAM CORPORATION are obtaining a motor pump and tender.

DUNDEE ELECTRICITY COMMITTEE propose the purchase of a steam lorry.

HORNSEY COUNCIL have decided to obtain six battery-propelled lorries.

COOKHAM RURAL COUNCIL have purchased a lorry at a cost of £1,200.

GLASGOW ELECTRICITY COMMITTEE have ordered two more 5-ton electric vehicles.

WHITEHAVEN COUNCIL have applied for sanction to borrow £1,150 for a motor fire engine.

BURY ST. EDMUNDS COUNCIL have bought a second-hand chassis as a tractor for the fire engine.

POPLAR COUNCIL have acquired four 5-ton steam tipping wagons from the Government at £570 each.

RUSHDEN URBAN COUNCIL require a loan of £1,250 for the purchase of a battery-propelled vehicle.

WILLESDEN COUNCIL have ordered a wagon with tipping body from Leyland Motors, Limited, at £1,000.

STIRLING COUNCIL have resolved to use motor wagons instead of horses for municipal carting and cleansing.

LUTON CORPORATION have placed a contract with Edison Accumulators, Limited, for a 3½-ton battery vehicle.

NORTHALLERTON URBAN COUNCIL have been advised by their surveyor to purchase a tractor and two wagons.

MANCHESTER CORPORATION have obtained two wagons from the Sentinel Wagon Works, Limited, for the gas department.

EAST SUSSEX COUNTY COUNCIL are expending £10,000 on the purchase of motor vehicles and plant for road maintenance.

LEIGHTON BUZZARD COUNCIL have received Local Government Board sanction to borrow £1,200 for purchasing a motor fire engine.

FULHAM COUNCIL have obtained two Halley lorries from the Road Board, who are disposing of vehicles brought back from road work in France.

BRADFORD CORPORATION have obtained a chassis, with detachable lorry and passenger bodies, for the sewage department, and a car lorry for the water department.

DEPTFORD COUNCIL have purchased three Halley lorries returned from road construction in France. The Works Committee state that the outlay will result in a saving to the rates.

ILFORD COUNCIL have been informed by the General Vehicle Company, Limited, that the price of a battery-propelled chassis with tipping body will be £1,362, an increase of £73.

GLOUCESTER COUNTY COUNCIL have resolved to purchase thirty of the heavy lorries returned from road work on the British front in France. At its present charges the Council consider that horse haulage will be too expensive.

PRESTON COUNCIL have appointed a sub-committee to consider the desirability of adopting mechanical traction for cleansing and carting work, the borough surveyor having reported on the merits of respective types as viewed by him in various towns.

BOURNEMOUTH COUNCIL have been recommended by the borough surveyor to accept a tender from Messrs. Dennis Brothers to supply a motor fire engine at £2,483, inclusive of an engine with first aid appliances and a 30-ft. ladder for £1,345, and a chassis at £1,038.

A YEAR'S OUTLAY ON WAR VEHICLES. The report of the Auditor-General on the 1917-18 accounts of the Ministry of Munitions indicates that during the year mentioned £36,813,096 was spent on vehicles of all descriptions; upon tanks, £9,587,000 was allotted.

AN APPEAL TO LONDON MOTOR CAR OWNERS. An appeal is made by the City of London Motor Transport Volunteers to the owners of motor cars and lorries in London to remember their "debt" to the limbless, paralytic, and wounded who are now housed in hospitals and homes all over London, and who are pining for a run out into the fresh air. Owners are requested to communicate with Major Sir John Lister Kaye, Bart., at Headquarters, City of London R.A.S.C., M.T.V., 235, Oxford Street, W.1. The M.T.V. supply all petrol.

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MOTOR TRAFFIC

MOTOR TRAFFIC NOTES.

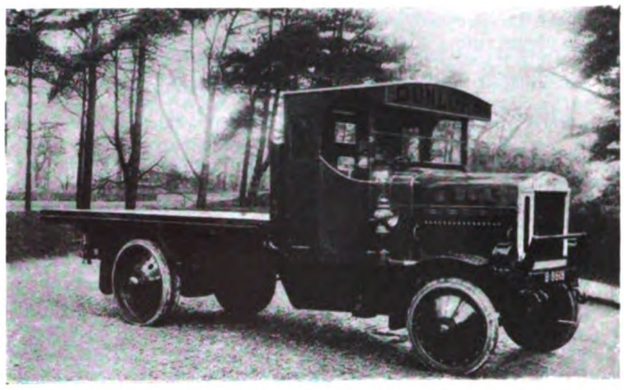
A Grant for London Roads.—Out of the sum of £79,000 required for road repairing in Hackney, the Road Board have granted £50,000 to the Borough Council.

Omnibuses for Portsmouth.—For the carrying out of the plans of the Tramways Committee for operating omnibuses in connection with the tramways, Portsmouth Corporation have agreed to purchase ten omnibus chassis of Thornycroft make.

Benzole Depots.—The Commercial Motor Users' Association, acting in conjunction with the National Benzole Association, have issued a list of suppliers of benzole throughout the country, and the hours during which this fuel can be obtained.

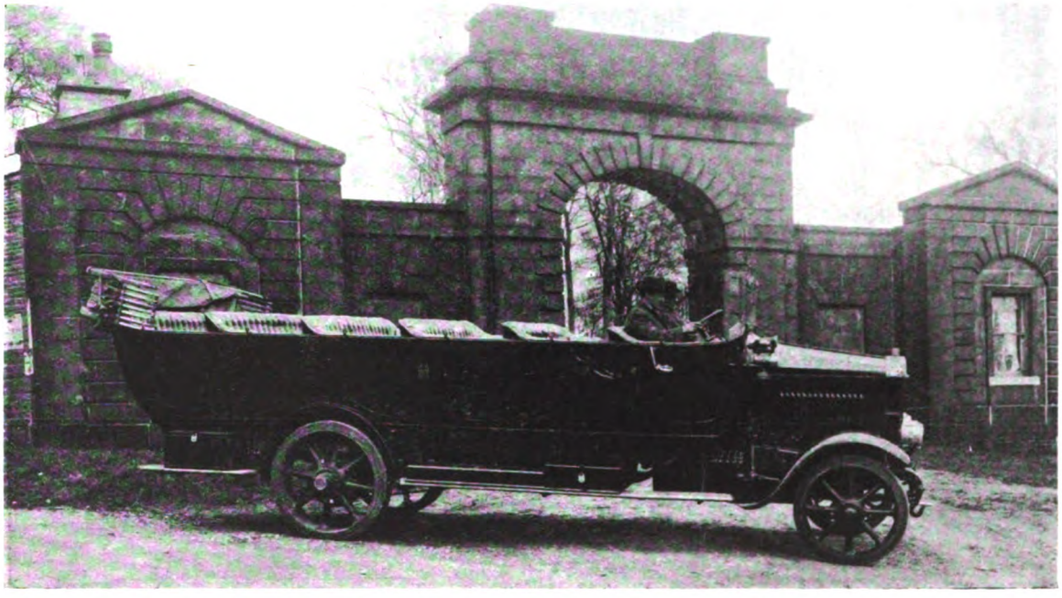
Applications for Omnibus Powers.—Among the local authorities applying for powers in the present session for the running of motor omnibuses are the London County Council, Middlesbrough, Coventry, Stockton-on-Tees, Stretford, Walsall, and Tynemouth.

Prices for Solid Tires.—For the supply and fixing of four solid rubber tires to a disinfecting van the following quotations were received by Westminster Council:—Macintosh and Company, £22 (accepted); Avon Rubber Company, £22 3s. 3d.; Dunlop Rubber Company, £23 3s. 11d.; Thornycroft and Company, £24 4s.

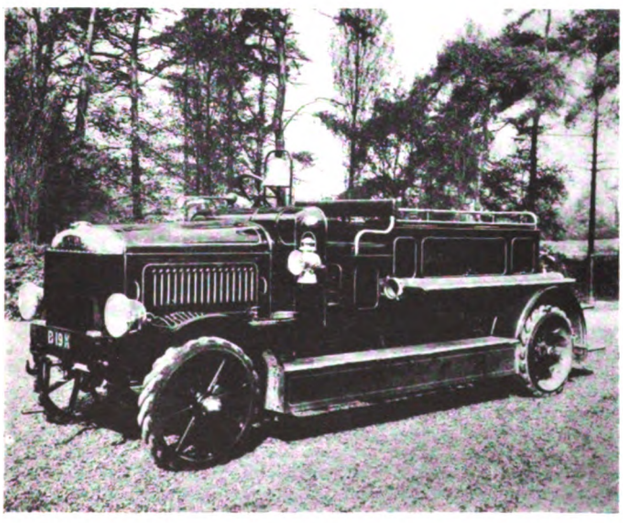


A Leyland Float.

Progress of Triplex Safety Glass.—The Triplex Safety Glass Company, which does a large business in wind screens, etc., made of safety glass, have increased their nominal capital to £200 000



A Karrier 50-H.P. Chars-a-banc, which does 8 to 10 Miles per Gallon on Hilly Roads.



A Leyland Fire Engine.

An issue of 60,000 £1 shares was offered to the shareholders at 15s. premium.

Improvement of West Bromwich Roads.—At an estimated cost of £53,000 the roads of West Bromwich are to be greatly improved. The plans submitted by Mr. Greatorex, the borough surveyor, include surfacing main roads and the principal secondary roads with tarmac.

Middlesex and the L.C.C Omnibus Bill.—With a view to impressing upon the London County Council the necessity of consulting the Middlesex County Council in such schemes, the latter body has decided to oppose the Bill of the former Council in which authority is sought to run motor omnibuses.

Scottish Rural Transport.—The question of rural transport facilities, including motor transport, has been considered by a special committee appointed by Mr. Munro, Secretary for Scotland. In the House of Commons on May 8 it was stated that the committee had presented their report, and that it was receiving consideration by Mr. Munro in consultation with the Scottish Board.

A Leyland Float for Dunlop Rubber Company.—One of the views on this page shows a G type Leyland float wagon, which has recently been delivered to the Dunlop Rubber Company for their cotton mills in Rochdale. The machine is a standard wagon, but is finished in unusual colours which the camera does not, of course, indicate, the colours being the familiar Dunlop yellow with black lettering.

Omnibus Fares.—In the House of Commons on May 13, Mr. Shortt, in reply to a question by Mr. Higham, said that an investiga-

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MOTOR TRAFFIC

tion into the increase in omnibus fares was proceeding, and would occupy some time. He had no power to order a reduction in the fares. If fares were found to be excessive it would have to be considered in what manner the Government should proceed.

MOTOR DRIVERS TRAINED DURING THE WAR.—More than 70,000 men were trained as drivers of mechanical vehicles of the Royal Army Service Corps during the war, and their services were of untold advantage on all the various fronts. At the outbreak of hostilities the corps numbered 500 officers and 6,000 of other ranks When the armistice was signed the totals were 11,000 and 315,000 respectively.

CAMBERWELL APPLICATION TO THE ROAD BOARD.—Notwithstanding that London contributes a large sum in motor fuel taxation to the revenue of the Road Board, there are only a very few instances in which the Board have made a reasonable contribution to road maintenance in the metropolitan district. Camberwell Council have now applied for a grant of £51,600 for repairs of roads largely used by motor traffic of all descriptions.

ANOTHER ASPIRANT TO OMNIBUS OPERATION.—To the numerous municipal authorities who are applying this session for powers to run motor omnibuses, there has to be added the Cannock Urban Council. Extra means of locomotion are much needed in this Staffordshire mining district, and the Council ask for authority to operate omnibuses both within and outside the urban district. Walsall Council are lodging a petition against the Bill.

AUTO-CARRIER DAMAGED ON TRAMWAY.—The London County Council were cast in damages amounting to £23 and costs at Westminster County Court on May 29 in an action brought by Messrs. Arnold for damages to an auto-carrier. When turning out of Tunnel Avenue, Woolwich, into the main road the carrier skidded through the tramway line projecting one and half inches above the level of the setts. The carrier ran into a lorry and was damaged.

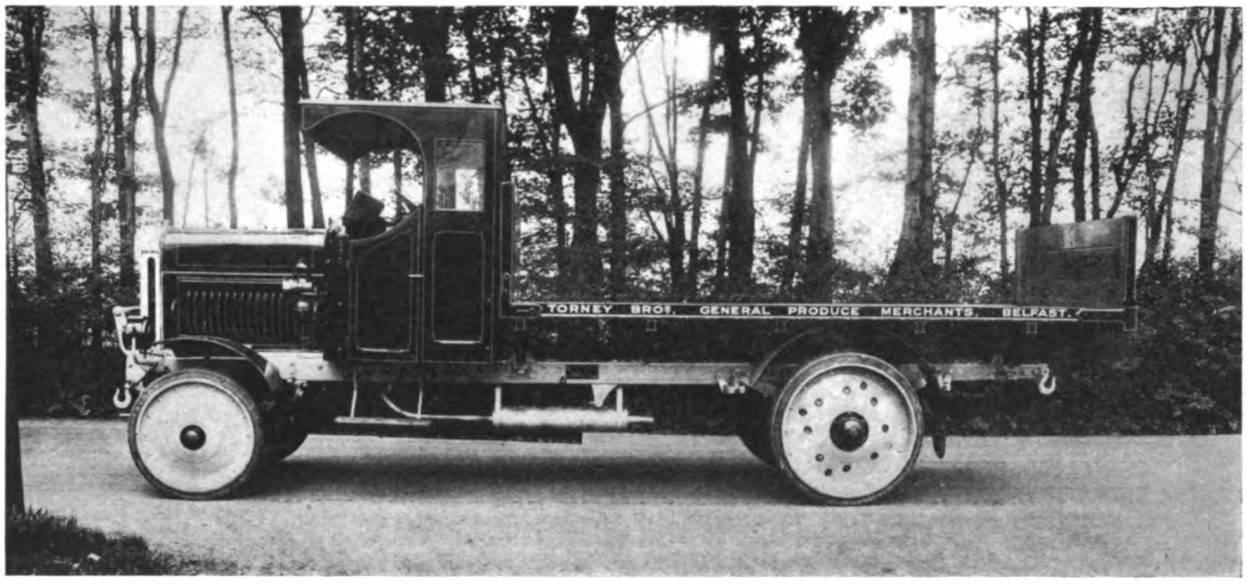
LONDON-SOUTH COAST OMNIBUS SERVICES.—Now that petrol shortage is a thing of the past, attention is being turned to the facilities provided for journeying by motor omnibuses between London and the chief towns in West Surrey, Kent, and Sussex, as well as the seaside resorts in the two latter counties. It is necessary to ascertain the connections if the passenger does not desire to lose time, and some of the trips are by chars-a-banc, for which a higher fare is charged.

FARMERS' TRANSPORT FACILITIES.—The transport facilities required by farmers, said Lord Ernle during a debate in the House of Lords on the Government's agricultural policy, were in the form of road motor services and not light railways. The Board of Agriculture had submitted a proposal to the Treasury and the matter would be taken over by the Ministry of Ways and Communications. In addition to a motor service what was termed a trench railway scheme would be extremely valuable.

CHARS-A-BANC REGULATIONS IN LANCASHIRE.—The Roads Committee of Lancashire County Council have imposed the following conditions for granting an application to put on a regular service of chars-a-banc in the Sabden-Clayton Moors-Clithero district for five years:—Car-mile payment of 2d. per mile and an initial fee of one guinea per annum per vehicle; only home-to-home routes to be used as defined by the county surveyor; journeys and number of passengers to be recorded daily, the book to be open to official inspection at any time.

BRITISH ARMOURED CARS IN RUSSIA.—Details of the landing of British armoured motor car division in Russia were given at a reunion of 250 members of the division at the Holborn Restaurant, by Commander Locker-Lampson, M.P. Upon reaching the port in Russia he was told that the squadron must return home. However, he insisted in landing a few sick men, and in that way the force was got ashore. Recently he received a telegram from General Denikin asking him to come to Russia again, and if he received the support of the Treasury he intended to do so.

ALBION MOTOR.—The directors' report for the year ended December 31 states that, after deducting necessary depreciations and other expenses, there remains a net profit of £76,511, which, with £17,513 brought forward, makes a total of £94,024. From this the directors have transferred £30,000 to the reserve fund, and after making allowances for debenture discount and expenses, and deducting preference and interim dividends, there remains £44,532. The directors recommend a final dividend of 15 per cent. on ordinary shares, making 20 per cent. for the year, and a carry forward of £25,153.



A Leyland Lorry.

WAR'S EFFECT ON CIVIL TRANSPORT.—We have already reported the decision of the committee of the Red Cross Society and the St. John Ambulance Association to distribute a large number of war ambulances for civil hospital work throughout the country. Two additional instances of beneficial effects resulting from the war have now to be recorded. The Scottish Red Cross Society have presented 100 ambulances to the St. Andrew Ambulance Association for use all over Scotland. The 50 ambulances which were presented to the Red Cross by the Scottish colliery owners and workers are being returned to the donors to be utilised as colliery ambulances.

EXETER-TORQUAY OMNIBUS SERVICE.—The Tramways and Streets Committees of Exeter Corporation have recommended the Council to attach a number of conditions to their approval of the proposed motor omnibus service between Exeter and Torquay. Among other conditions, they require that no passenger be taken up and set down within the limits of the city, that the minimum fare be 6d. for all passengers, and that certain specified streets be excluded from the routes. A committee representing Devonshire County Council and other highway authorities have advised that the institution of the new route should be authorised on condition that payments are made towards road maintenance, and that the County Council be allowed 5 per cent. of the gross receipts to cover the cost of checking the monthly returns and collecting the moneys.

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THE
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SATURDAY, JUNE 21, 1919.

PUBLICATION OF TRAFFIC RETURNS.

DURING the war nearly forty tramway undertakings suspended the weekly issue of traffic returns. The fact that the most important systems from a national point of view, and the largest in point of mileage, contrived to continue the practice seems to show that there were no weighty reasons of policy or other insuperable difficulties in the way. There were excuses, some of which amounted to justification, and the public interested doubtless regarded the omission with tolerance. At present, however, there are no signs that the tramway authorities so indulged intend to resume discharge of what is actually a public duty, and it is probable that some may construe pardon for an omission as acquittal from the obligation. It is in the public interest that the records of all forms of tramway traffic should be published. A transport system so intimately related to the social and industrial life of the community must be carried on openly. Company undertakings, however, can claim a certain degree of immunity from public observation, because the undertaking is their business, financed with their capital, and carried on for their profit by people whom they employ. London Underground Railways Company have demonstrated the great advantage to be gained by a passenger transport undertaking winning the public confidence and friendly interest by frank invitation and open statement. A company may choose to forgo that advantage, and maintain a policy of secrecy, and no one has the right to deny it. It is quite different, however, with a tramway undertaking owned and run by a local authority. The service belongs to the community, lock, stock, and barrel, and the members of the community have the right to know every detail of the business. The capital has been borrowed on the security of the rates; the service is instituted solely for the convenience of the populace, and every officer, from the tramcar cleaner to the general manager, is a servant of the public. For tramway managers or corporation tramway committees to assume that the issue of traffic returns at stated and regular intervals is a matter of grace on their part is to mistake the whole position. The public are entitled to know how their business is going on, and what is the measure of its prosperity or the reverse. In certain cities, which could be named, the weekly returns of the tramway undertakings are eagerly read and scanned with an interest not unmixed with pride. To the average man, the knowledge that he has a personal stake in an undertaking so conspicuous, handling traffic so vast, exhibited in figures so colossal, gives a pleasure which is neither selfish nor mean, and from the fluctuations in traffic and receipts he learns to appreciate by at least a little some of the difficulties encountered by tramway managers. Well-informed public opinion, it is needless to add, is a valuable asset to every tramway undertaking.

LONDON TRAFFIC INQUIRY.

The Select Committee of the House of Commons appointed to enquire into conditions of transport in the metropolitan area resumed sitting on Tuesday, June 17. Mr. G. H. Hume, ex-chairman of London County Council Highways Committee, was further cross-examined, and in answers to questions stated that the London County Council had tried to avoid wasteful competition with omnibuses, but the General Omnibus Company made negotiation difficult; that the Council, during the period between 1901 and 1919, had deposited plans with Parliament for schemes involving a mileage of 186 miles, and of these 105 miles were struck out under Standing Order 22; that the story of London traffic would have been altogether different but for the veto of local authorities; that London County Council had no understanding with the traffic combine in regard to fares; that a central authority for London traffic is imperatively required.

Mr. J. Calvert Spensley, assistant valuer London County Council, presented a series of tables relating to traffic, housing, and cognate matters.

Sir H. Haward, L.C.C. Controller, in the course of statistical evidence, stated that during the five years before the war the tramways showed a surplus of £355,000, and during the war a deficiency of £365,000.

At the resumed sitting on Wednesday, Sir H. Haward, in answer to cross-examination, said that there was great reluctance on the part of the Council to raise fares. He exhibited a diagram showing the growth of expenditure five years before the war and during the five years of war. Salaries, wages, and allowances for the current year amounted to more than the total revenue of the undertaking in the year before the war. It was only when a deficit occurred that fares were raised. Sir Harry admitted that, if a just proportion of the wear of the streets were levied on the rates, it would give the tramway finances some relief. He also conceded that, if the period of debt redemption was extended, the annual charge on that account would be appreciably reduced. The Controller could not see any prospect of fares being reduced in the immediate future.

Mr. A. L. C. Fell, general manager of L.C.C. tramways, was the next witness. In a precis of his evidence which had been prepared, he stated that the Council's system comprised 150 street miles of tramways, with 1,662 electric cars and 152 trailers. The system had never been designed as a whole, and there were 14 dead ends in the central portions of London. He thought the tramways should be allowed a higher speed limit. He would like to see the by-laws of Glasgow adopted to guard against vehicles dashing in among passengers trying to board the tramcars. Mr. Fell did not see much prospect of relief from congestion for a considerable time.

Continuing his evidence on Thursday, June 19, Mr. Fell said that forty more cars had been put on the streets since the traffic question was taken up by Parliament three or four weeks ago. The life of a car was indeterminate, parts being constantly renewed. New cars, which formerly cost £1,000, now cost £3,000. In answer to a question by the Chairman, Mr. Fell stated that a net profit of 3d. to 4d. per mile would satisfy the financial requirements of the undertaking. Efforts to connect up some of the dead ends had been abandoned on account of the heavy cost involved. After severe heckling on the question of fares, Mr. Fell wound up with the remark that "the intention had been to do their best to do justice to the passengers." He also was glad of the opportunity of denying that he had any interest direct or indirect in the combine. At the close of the sitting, Mr. Fell was thanked for the "full, frank, and free way" in which he had given his evidence.

Motor Lorries for Morocco.—Although good motoring roads are not numerous in the Spanish zone of Morocco, there is a demand locally for motor vehicles. A certain amount of business might be secured by British firms if they address the Army Service Corps Department (Intendencia Militar), at Tetuan, Ceuta, and Melilla, with offers to supply motor lorries, tyres, spare parts, lubricating oils, etc.

Glasgow Tramways.—Invitations have been issued in connection with the celebration of Glasgow Corporation Tramway Department's semi-jubilee. The Convener and his Committee have arranged for an inspection of the works of the Department on Tuesday, July 1st—the anniversary of the undertaking—while later the guests will be entertained to luncheon in the City Chambers. Appropriately, the outing to the Departmental Works will take place in tramcars.

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MUNICIPAL ELECTRICAL ASSOCIATION CONFERENCE.

The Municipal Electrical Association held its annual conference at Felixstowe this week under pre-war conditions of attendance and interest. The opening session took place on Wednesday at Ipswich the members travelling there by special train in the morning. The Mayor of Ipswich, Mr. E. C. Ransome, chairman of the Ipswich Electric Supply and Tramways Committee, cordially welcomed the Association at the Public Hall at ten a.m. Mr. Frank Ayton, engineer and manager of the Corporation Electricity Supply and Tramways Department, then delivered his presidential address, and Alderman W. Walker, of Manchester, read a paper on "The Whitley Report," dealing with the application of its recommendations to the electric supply industry. After luncheon, visits were paid by the members to the electric vehicle works, etc., of Ransomes, Sims and Jefferies, Ltd., to the works of Reavell and Company, Ltd., and to the Corporation's electric power station, tramway depot, repair shops and electric vehicle garage. Later in the afternoon the visitors were the guests of the Mayor at tea in Christchurch Park. In the evening the annual dinner at the Felix Hotel was largely attended.

On Thursday a discussion on "Electric Transmission Considerations" was opened by Mr. S. L. Pearce, chief electrical engineer of Manchester, and a paper on "The Rating of Electric Supply Undertakings" was read by Bailie W. B. Smith, of Glasgow. The afternoon was devoted to a cruise among war vessels in the harbour and up the Stour estuary to view a German submarine.

On Friday the annual business meeting was held, when the Council's report was adopted, and the following officers were elected: President: Mr. Thomas Roles, Bradford; vice-president, Mr. S. T. Allen; hon. secretary, Mr. A. C. Cramb.

THE PRESIDENTIAL ADDRESS.

Mr. Frank Ayton, in his interesting presidential address, said that the fact that this was the first post-war convention planned on the lines of pre-war days, gave an added importance to the occasion, and still greater importance was attached to it by reason of the momentous changes that are being made in the organisation of the electric supply industry. Posterity would concede that so far as concerned the electrical industry, the war had done good by bringing the nation to recognise the importance of electric supply and the general inefficiency and drawbacks of the present methods of electrical generation and distribution. During the war electric supply undertakings were carried on under difficult conditions, and the lot of the central station engineer, especially in the case of those responsible for catering for industrial demands, had not been an enviable one. The end of the war had brought with it a considerable falling off in industrial demands, but this was a temporary condition which would right itself as soon as a normal peace footing could be re-established, labour difficulties composed, and restrictions on export trade removed.

The Government's Electricity Bill followed closely the main lines of the Williamson Committee's report. The association had put forward its recommendations for amendments, and it remained to be seen how far those would be adopted. If the Bill was altered as they desired and the important principle of public control safeguarded, then in his opinion its provisions would be of immense benefit to the nation, and in particular to the electric supply industry. The ultimate success of the Bill would largely depend upon the choice of the Electricity Commissioners and the constitution of the District Boards. It was to be hoped that the Commissioners would be chosen solely for their technical and business qualifications. In that case the electric supply industry would be freed from the legislative shackles which for so many years had impeded its development. The electric supply industry was now part and parcel of the manufacturing organisation of the country, and was indissolubly linked with the future prosperity of the nation's industry. To secure that prosperity, a cheap and abundant supply of electric power was one of the main necessities. New conditions would compel the use of a greater amount of machinery, and therefore power per employee than had been the case in the past. The wonderful expansion during the war was an index of the increased demands that would be made in the future, and the business-getting side of electric supply must be developed to a far greater extent than in pre-war days.

In the eulogies from official sources upon their services during the war, they had a great and valuable heritage to make use of in the extensive publicity campaign which, as the result of the formation of the Electrical Development Association, they had reason to hope might soon be inaugurated. It was a source of satisfaction to the Association that a well-known member, Mr. J. W. Beauchamp, had been chosen as its director. It ought to be the aim of every electric supply committee that its production should bring benefit to the greatest possible number of inhabitants in the area. The Association could point with pride to its record of propagandist efforts in connection with the Electric Vehicle Committee. The credit for the inception of that movement, now having so marked a degree of success, belonged to the I.M.E.A. The twelve months terminating with the convention would be marked in the annals of the Association as the busiest, the most strenuous, and the most important year of its existence. The annual report gave some idea of the many important matters which had claimed the attention of the Council. The Association, however, owed much to its honorary secretary, Mr. Faraday Proctor, for his splendid services. They much regretted that Mr. Proctor had found it necessary to relinquish the honorary secretaryship, and he thought the Association fortunate in securing Mr. A. C. Cramb as his successor.

TRAMWAYS AND LIGHT RAILWAYS ASSOCIATION.

ANNUAL DINNER AND CONCERT.

The annual dinner of the Tramways and Light Railways Association is to be held at the Connaught Rooms, Great Queen Street, Kingsway, London, W.C., on Friday, July 25, and will be followed by a concert. A large attendance is anticipated, and members are requested to notify the Secretary of the number of seats they will require at an early date. As on a former occasion, it is intended to arrange the guests at small tables accommodating parties of eight. No annual congress in the provinces can be held this year, owing to the difficulty of obtaining convenient hotel and railway accommodation. The annual meeting will be held in the afternoon of July 25, and it is hoped that one or two papers will be read. Further particulars will be published later.

THE LICENSING OF TRAMWAY CARS.

BLACKPOOL AND FLEETWOOD TRAMROAD COMPANY FINED.

The Blackpool and Fleetwood Tramroad Company were the defendants on June 12 in a summons issued for using a tramway car as a hackney carriage. The case was brought by the Urban District Council of Fleetwood, who established their right to require a licence for all cars used on the Blackpool and Fleetwood tramroad. Licences had always been applied for in respect of the cars, and they had always been granted. This year the Tramroad Company, however, challenged the right of the Council to license the cars. Mr. A. Cottam, who prosecuted, said that local authorities were empowered to make and enforce by-laws regulating speed, length of stoppages, number of people to be carried, etc. The Tramways Act of 1870 provided that local authorities should make by-laws and enforce them, and they also had power to license all carriages using the trmways and all drivers and conductors having charge of such cars. Mr. J. R. Gaulter, for the Company, said that they had been paying five shillings a year in respect of the licences for each car, but this year they challenged the liability to pay. He submitted there was no case under the section of the Act cited by Mr. Cottam. The cars were run under powers granted by Act of Parliament, and they were therefore under no obligation to pay licences to a local authority. Mr. J. C. Cameron, secretary and manager of the Blackpool and Fleetwood Tramroad Company, said that the licences had been taken out under a mistaken law, because they did not know their legal position. The local authorities had no jurisdiction as to the number of passengers carried, fares to be charged, and distance to be run without a stop. In the event of the local authorities refusing to license the cars, they would be compelled to run them by Act of Parliament. The Bench decided that the Council had the right to issue licences in the case, and fined the Tramroad Company twenty shillings. Mr. Gaulter asked for and was given leave to appeal.

The Tramways and Light Railways Association.—The Journal of the Association for June contains further rulings of the Joint Committee, in continuation of those gven in the issue for May.

Light Railway in Lancashire Authorised.—We are officially informed that the Board of Trade have confirmed the Order made by the Light Railway Commissioners authorising the construction of a Light Railway in the County Palatine of Lancaster, in the Parish of Davyhulme and the Urban District of Stretford.

Extension Proposals at Greenock.—Proposals for extensions of the Greenock and Port Glasgow Company's lines have been laid before the local authorities interested. In their letter to Greenock Corporation the Company point out that the extensions could not be carried out under present conditions of tenure, and that prolongation of lease would be necessary.

South Shields Tramway Fete.—For the purpose of marking the appreciation of the strenuous services of the officials and employees of the South Shields Corporation tramways, the Council recently allocated £700. A liberal proportion of this sum was devoted to a fete that took place on Wednesday, June 11. Under ideal conditions of weather, about six hundred men, women and children gathered in the beautiful grounds of Cleadon Park. The guests were conveyed from the town to the grounds in the Corporation motor omnibuses, the tramway service being suspended from 10.30 a.m. until 2 p.m. The public gladly sacrified their convenience on this occasion and cordially supported the chairman, Alderman W. G. Wylie, and the members of the Tramways Committee in their efforts to make the occasion successful. The programme was provided by the employees themselves and included a variety of sports. Tea was provided and the tramways band was in attendance throughout the afternoon and evening, while a string band played in a mansion in the park, where dancing took place. The balance of the £700 has been apportioned by the Council so that every employee should receive £1 for each year's service, while the sum of £50 was allocated to the dependents of those who gave their lives for their country. A memorial tablet is to be placed in the recreation room at the tramway sheds.

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MISCELLANEOUS NEWS AND NOTES.

Women Drivers at Blackpool.—At Blackpool a woman is driving a car on which a man is acting as conductor.

Strike at Buenos Ayres. During the past week, the tramway employees in Buenos Ayres have been on strike, and the drivers of all the hackney vehicles have joined in a sympathetic strike.

The Society of Engineers.—The Council of this Society has promoted a scheme for the Association of Engineering Societies, of which particulars may be obtained from the Secretary, Mr. Alfred S. E. Ackermann, 17, Victoria Street, London, S.W.1.

£73,000 for Main Roads.—As the result of an appeal made by a deputation headed by Sir John Bethell, the Road Board has made a grant of over £73,000 to the Borough of East Ham towards the reconstruction of the main roads in the borough.

Omnibuses Supplement Tramway Service.—Wigan Corporation Tramways Committee have decided to try the experiment of running omnibuses on the tramway routes with a view to relieving the severe congestion of traffic on the tramcars.

High Price of Motor Spirit.—A meeting of motorists held in York on June 12 passed a resolution protesting against the price of motor spirit, and urging the Government to remove at once the restrictions at present hampering the production of commercial alcohol for motor purposes.

Free Passes at Leicester.—In 1918 157 passes were issued by the Leicester Corporation Tramways Committee to the blind and 92 to the crippled. Non-commissioned officers and men of H.M. Forces in uniform are allowed to ride on the Leicester cars at half fares and wounded soldiers are carried free.

Proposed Light Railway at Braintree.—At the meeting of Braintree Rural District Council last week, plans were submitted for the construction of a light railway from Braintree to Marks Tey. It was decided to refer the plan to the Councils of the parishes through which it was proposed to run the railway.

Money for Plymouth Roads.—Major Astor, Parliamentary Secretary to the Local Government Board, in a letter to Plymouth Town Council, states that the Road Board has agreed to grant the town £16,000 of the £25,000 required for improvement schemes, and that the Local Government Board has sanctioned a loan for the remaining £9,000.

Free Passes to Town Council Only.—Edinburgh Town Council has decided that all members of the Council shall be granted free passes on the Corporation tramways. Applications for a similar privilege were received from Edinburgh Parish Council, from the managers and proprietors of theatres in the city, and others, but all applications were refused.

Edinburgh Tramways.—Edinburgh Council has remitted to a sub-committee the fixing of routes and fares. In connection with the motor omnibuses, it was suggested that in the event of the Tramway Committee being unable to proceed with the tramway extension to Corstorphine, motor omnibuses should be put on the route, but as the Corporation would have to obtain powers to run motor omnibuses over the route, it was decided to take no action at present.

Cars Damaged by Storm in Glasgow.—A thunderstorm causing the heaviest rainfall on record (2.30 in. within 4 hours and 45 minutes) raged for several hours in the Glasgow district on June 12. The tramway service was interrupted between 7 and 9 o'clock, but serious delays were caused on only three routes, where a number of cars were derailed and had to be withdrawn to the shops for repairs. The difficulty occurred mainly where there was a dip in the track, particularly under railway bridges, sand and dirt being washed into the grooves of the rails and the points blocked, but the water subsided rapidly after the rain ceased, and little permanent damage was done.

Alleged Neglect of Burley by Leeds.—Burley is a sparsely populated district of Wharfedale, lying on the outskirts of Leeds, and in the days when rolling stock was plentiful, the Corporation Tramways ran a regular service thither. The neighbouring district of Otley is more populous, however, and as there are too few tramway cars to serve both districts, Otley gets the preference. Burley-in-Wharfedale District Council has taken this slight very seriously, and at a recent meeting passed a resolution protesting against the "despicable treatment" which passengers were receiving on the Burley route. In supporting the resolution, Mr. Howard Arnold-Forster said the trams were the poor man's motor car, but it was evident the Leeds Corporation had been diverting the traffic to Otley because they could make more money by doing so, although it was at the expense of the convenience of Burley. What about Otley, not to mention Leeds ratepayers?

Greenock Tramway Extensions.—The Greenock and Port Glasgow Tramways Company desires to extend its system to cope with the anticipated future industrial development and the present need for increased facilities. Particulars have been given to the Greenock, Gourock and Port Glasgow Corporations of the plans proposed. It is intended to extend the line by one mile at Langbank and in Greenock to make a junction from West Blackhall Street to Nicolson Street along Inverkip Road, and later from Greenock West Railway Station east to Wellingburn Street and Rue-End Street. As an alternative, the proposal is to have a track from Wellingburn Street through Regent and Lynedoch Streets and Drumfrochar Road. The line at Gourock it is proposed to extend to a point near Cloch Lighthouse. The company adds that it is obvious the extensions could not be carried out without an extension of the conditions of the lease, which expires in 1928.

The Zenith Carburetter Company inform us that Commander Read's seaplane N.C.4, the first to cross the Atlantic, was fitted with a standard Zenith carburetter, as are all the American Liberty engines. Drivers of cars fitted with Zenith carburetters will be interested to learn also that the car on which Ralph de Palma covered a kilometre at 150.5 miles per hour and a mile at 149.9 miles per hour at Daytona Beach was fitted with a stock Zenith carburetter.

Irate Passenger Fined.—A middle-aged solicitor travelling in a London United tramcar at Chiswick, wished to get off in a a hurry, and as the conductor was upstairs rang the stopping signal. For some reason or other, the driver did not pull up quickly enough, and the old gentleman smashed one of the car windows with his stick. In consequence, he was still further delayed by having to attend a policeman to the nearest police station, and next day was fined 10s., and ordered to pay the damage by the magistrate presiding at Acton Court.

Reduced Hours and Pay.—Interpretation of the National Agreement on the 48-hour week continues to cause disputes in various localities. At Kirkcaldy, the men formerly worked 60 hours per week and under the agreement received 57 hours' pay for 48 hours' work, but as this involves a reduction in their weekly earnings of 3s., the men have protested. Kirkcaldy Corporation Tramways Committee propose that the matter should be made a subject of negotiation between the Corporation and the men, and, failing agreement, that the Chief Industrial Commissioner be asked to appoint an arbiter.

The Standardisation of Tramway Wheel Centres.—The British Engineering Standards Committee has informed the Tramways and Light Railways Association that after consideration of the information submitted by the Council of the latter, it has been decided to recommend to the Sub-Committee on Tires, Axles and Springs the adoption of the following:—(1) a standard driving wheel centre of 27 in., with alternative dimensions of 32 in. or 33 in. over the tread; (2) a standard pony wheel centre of 17 in. with dimensions of 22-in. over the tread. It is hoped that tramway undertakings will accept these dimensions.

Extensions of Service at Chesterfield.—At present, Chesterfield tramway system terminates at Whittington Moor, and the inhabitants of New Whittington have requested that the service should be extended to them. In response, Chesterfield Corporation Tramways Committee have instructed the borough surveyor to report upon the feasibility of establishing an omnibus route in that direction. With regard to the new motor omnibus service to Newbold and the Brushes, the Town Council have agreed to pay to Whittington and Newbold Urban District Councils an allowance of ½d. per omnibus mile for road maintenance.

Privilege Tickets.—The fact that a municipal tramway undertaking is a commercial concern is not yet quite appreciated by a number of the inhabitants of the Isle of Man. The ratepayers of Douglas have hitherto enjoyed the advantage of privilege tickets entitling them to travel at 33 per cent. under ordinary fares. The Tramway Committee of the Town Council decided last week that the issue of privilege tickets should be suspended as from next month, and the proposal was received with a storm of opposition. After the matter had been fully discussed, however, the Town Council, by a majority, accepted the recommendation of the Tramway Committee.

Convention of the Industrial League.—The Industrial League are arranging a three days' summer convention of employers and employed, to be held on August 12, 13 and 14 at Birmingham. Representatives of employers' and employees' organisations are being invited and papers will be read on matters pertaining to labour, industry, education, etc. Mr. G. H. Roberts, M.P., will deliver the inaugural address, and Mr. H. A. L. Fisher, M.P., Mr. Neville Chamberlain, M.P., and the Lord Mayor of Birmingham will take part in the proceedings. Leading employers of labour and trade union representatives in the Midlands have promised to attend. Further particulars may be obtained from the Secretary, 66, Victoria Street, London, S.W.1.

Conductor Caught by Trolley Rope.—A conductor on a Metropolitan Electric Company's car had a narrow escape on Whit Monday near North Finchley. After tying up his trolley rope the conductor was about to leave Tally Ho Corner on a Cricklewood car when a rope hanging loose from the trolley of a passing car caught about his neck and lifted him off his feet. The weight of his body pulled the trolley off the wire, thus causing the car to stop and allow him to escape from the rope without serious injury. The rope took the skin off his neck and he suffered from shock. It is stated that the accident was due to a woman conductor on the incoming car anticipating her duty by unfastening the rope attached to the trolley to enable the car to cross to the opposite rails.

Veto of Yarmouth Frontagers.—One of the main thoroughfares to the beach at Yarmouth is Regent Street, and the Corporation Tramway Committee have planned to lay a double track on the street in place of the present single track. But two-thirds of the frontage-owners in the street object, and the line cannot, therefore, be constructed. According to the annual report of the Tramways Committee, the gross profit on the system was £4,207, and as interest payments absorb £4,085, no provision can be made for sinking fund. As the tramway track is in need of repair, and the proposed improvement would add largely to the earning capacity of the undertaking, the veto of the frontagers seems a highly inconvenient obstacle for Yarmouth.

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Blackpool Contract Tickets.—So strong an objection was taken to the proposed increase in the rates for contract tickets by the Blackpool Corporation, that the matter was considered at a special meeting of the General Purposes Committee, when the suggested new charges were considerably reduced. The annual charge for tickets available over the whole of the tramways is to be £6, and for certain sections only, £3 and £2 respectively. The previous rate for the unlimited season tickets was £3.

Profits Reserved for Reconstruction.—In presenting the report of the Tramways Committee to Birmingham City Council, Mr. F. Smith moved that the Finance Committee be instructed to borrow £125,000, the cost of additional tramcars. In consequence of the increased fares, a satisfactory profit had been made, and the Committee suggested that £150,000 should be put to reserve, the greater part of the money to be spent on reconstruction work during the coming year. The report was adopted.

FINANCIAL.

Calcutta Tramways Company, Ltd.—The directors recommend a dividend of 6s. per share, making 8 per cent. for the year, free of income tax, and a carry forward of £22,639.

Cork Electric Tramways and Lighting Company, Ltd.—In their report for the year, the directors recommend that the balance of £3,649 remaining after paying dividend on preference shares, and making allowance for depreciations, etc., should be carried forward.

Rangoon Electric Tramway and Supply Company, Ltd.—Gross profits and interest on investments, £80,573, from which a balance of £13,297 remains, after deducting interest on debentures, renewals, allowances, preference dividend, etc. The directors recommend a dividend of 5 per cent. for the year, free of income tax, and carrying forward £4,447.

Swansea Improvements and Tramways Co.—The dividend of 6 per cent. for the year on the ordinary shares and the allocation of £3,000 to reserve, which the directors recommend, are the same as for some years past, and after payment of the dividend on the preference shares there will be £2,214 2s. 7d. to be carried forward, as against £2,654 5s. 9d. brought forward from last account.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended June 18 amounted to £82,983, an increase of £18,475 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to June 18 (eleven weeks and two days) the total receipts were £916,411, an increase of £226,825 on the corresponding period of 1918.

PERSONAL.

Mr. W. T. Robson, general manager and engineer of Southampton Corporation tramways, has been compelled to resign his position on account of ill-health. The Tramways Committee, in accepting his resignation, have placed on record their appreciation of his valuable services in the past, and greatly regret that his doctor advises him that he must not remain in the South.

CONTRACTS AND ORDERS.

Preston Corporation Cleansing Committee recommend the purchase of two electric vehicles at an estimated cost of £2,400.

York City Council have authorised a sub-committee to purchase a motor ambulance.

Wolverhampton Tramways Committee have accepted the tender of the British Thomson-Houston Company for the supply of four G.E. 249A motors required for renewals.

Scholey and Company, Ltd., 56, Victoria Street, Westminster, the licensees and contr ctors for Sandberg's "Insitu" treatment of rails, have secured contracts with the Corporations of Leeds and Sheffield for treatment of existing tramway rails. As previously reported in our columns, Messrs. Scholey have in hand contracts with the following tramway undertakings:—Croydon, Manchester, London (Metropolitan Electric), Birmingham, Bournemouth, Liverpool and Glasgow.

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ENGLISH ELECTRIC COMPANY
LIMITED.

Queen's House, Kingsway, London, W.C.2.

This Company, with a Capital of £5,000,000, has been formed to consolidate under one direction and management the various interests of the following companies, in all of which a predominating control exists:—

COVENTRY ORDNANCE WORKS, LTD.
DICK, KERR & CO., LTD.
PHŒNIX DYNAMO MANUFACTURING CO., LTD.
UNITED ELECTRIC CAR CO., LTD.
WILLANS & ROBINSON, LTD.

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAME.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C.	June 10	461	742	+ 281	10	5,337	+ 19
Aberdeen Corporation	" 11	4,590	5,320	+ 730	1½	5,320	+ 730
Ayr Corporation	" 14	528	675	+ 147	4	2,694	+ 778
Belfast City	" 13	7,151	10,248	+ 3,097	11	112,364	+ 27,996
Birkenhead Corporation	" 15	2,112	3,341	+ 1,229	10⅞	28,718	+ 5,483
Birmingham Corporation	" 7	24,230	25,967	+ 1,737	10	256,071	+ 29,468
do. Motor Buses	" 7	1,610	1,747	+ 137	10	16,817	+ 1,922
Blackburn "	" 11	2,954	3,317	+ 363	11¼	27,343	+ 6,758
Bradford Corporation	" 14	9,769	14,006	+ 4,237	11	124,853	+ 33,783
Burnley Corporation	" 14	2,105	3,650	+ 1,545	..	..	..
Burton-on-Trent Cor.	" 15	392	563	+ 171	11	5,188	+ 886
Bury Corporation	" 15	1,963	2,960	+ 1097	10⅞	27,031	+ 4,945
Chatham & District	" 12	1,351	2,057	+ 706	23	32,412	+ 3,717
Cork Electric	" 12	666	758	+ 92	23	13,952	— 355
Derby Corporation	" 14	1,508	2,514	+ 1,006	11	20,485	+ 4,152
Dundee City	" 11	1,966	2,668	+ 702	3⅞	9,402	+ 1,779
East Ham Corporation	" 14	1,533	2,221	+ 688	10⅞	20,999	+ 5,796
Glasgow Corporation	" 14	28,940	33,345	+ 4,405	2	67,257	+ 6,168
Glossop (U.E. Sup. Co.)	" 14	174	274	+ 100	24	5,353	+ 958
Halifax Corporation	" 10	2,611	5,282	+ 2,671	10½	37,541	+ 8,973
do. Motor Buses	" 10	59	116	+ 57	10½	833	+ 293
Huddersfield Corporation	" 14	3,409	6,577	+ 3,168	11	54,314	+ 13,129
Ilford U.D. Council	" 14	993	1,547	+ 554	11	13,552	+ 2,982
Ipswich Corporation	" 14	741	1,258	+ 517	11	9,522	+ 1,757
Isle of Thanet	" 11	304	1,728	+ 1 424	36⅞	17,840	+ 10,344
Kilmarnock Corporation	" 14	214	275	+ 61	4⅞	1,280	+ 238
Lanarkshire	" 12	3,696	4,081	+ 385	23	76,171	— 4,068
Leeds City	" 14	13,293	22,125	+ 8,832	11	185,531	+ 56,459
Leicester Corporation	" 14	4,542	7,354	+ 2,812	..	..	..
Leyton U.D. Council	" 12	2,218	4,097	+ 1,879	11	34,762	+ 11,989
Liverpool Corporation	" 14	18,116	25,606	+ 7,490	23½	506,294	+ 96 249
Llandudno & Colwyn Bay	" 16	367	523	+ 156	24	8,556	+ 1,878
London County Council	" 18	64,508	82,983	+ 18,475	11⅞	916,411	+ 226,825
Maidstone Corporation	" 12	260	463	+ 203	10⅞	4,066	+ 1,056
Manchester Corporation	" 14	24,764	33,974	+ 9,210	11	333,898	+ 54,391
Newcastle-on-Tyne Cor.	" 14	9,159	10,242	+ 1,083	11	100,090	+ 13,147
Northampton Cor.	" 13	848	1,836	+ 988	11	14,129	+ 4,379
Nottingham Corporation	" 12	5,917	8,667	+ 2,750	11	76,238	+ 15,129
Oldham Corporation	" 15	3,364	5,186	+ 1,822	12	52,333	+ 10 804
Reading Corporation	May 29	1,302	1,634	+ 332	8⅞	13,032	—
Rotherham Corporation	June 11	2,063	2,668	+ 605	10⅞	24,026	+ 2,259
Sheffield Corporation	" 15	13,655	19,224	+ 5,569	11⅞	200,801	+ 42,177
Southampton Cor.	" 11	2,476	3,292	+ 816	10⅞	28,536	+ 2,454
Southend-on-Sea Cor.	" 11	1,089	3,388	+ 2,299	11	19,912	+ 10,124
South Shields Cor.	" 21	1,116	1,421	+ 305	7	9,409	+ 2,298
Sunderland Corporation	" 15	2,001	3,721	+ 1,720	11	32,132	+ 9,100
Swindon Corporation	" 14	280	335	+ 55	6⅞	2,031	+ 160
Torquay Tramways	" 12	874	1,451	+ 577	23	20,932	+ 3,142
Tyneside Trys. & Trmrds.	" 4	1,273	1,131	— 142	23	20,884	— 417
Wallasey Corporation	" 14	1,770	3,306	+ 1,536	10⅞	27,620	+ 8,069
Walsall Corporation	" 14	1,170	1,814	+ 644	11	15,669	+ 2,313
Walthamstow U.D. Coun.	" 14	1,518	2,349	+ 831	11	20,038	+ 5 663
Warrington Corporation	" 12	705	961	+ 256	10	9,430	+ 1,681
West Ham Corporation	" 12	4,377	6,697	+ 2,320	10⅞	59,025	+ 14,541
Wolverhampton	" 18	1,672	1 999	+ 327	11	23,281	+ 3,626

TRAFFIC RETURNS SUSPENDED.

The following Corporations and Companies have suspended the issue of their Tramway Traffic Returns during the War:—Accrington, Bath, Blackpool, Blackpool and Fleetwood, Bolton, Bournemouth, Brighton, Bristol, British Electrical Federation, Cardiff, Chesterfield, Colne, Croydon, Dover, Dublin & Lucan, Dublin United, Exeter, Glasgow Subway Co., Hull, Lancashire United, Leith, London General Omnibus Co., London United Tramways Co., Lowestoft, Metropolitan Electric Tramways, Ltd., National Steam Car Co., Nelson, Newport (Mon.), New St. Helens & District, Portsmouth, Preston, Provincial, Rochdale, Salford, South Metropolitan Electric Tramways, Sunderland District, Tramways (M.E.T.) Omnibus Co., Yorkshire (West Riding).

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	June 10	£56,754	£22,535	23	£1,274,826	+ £148
Auckland (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,382
Ballarat and Bendigo (4 wks)	Mar. 30	3,885	3,623	52	48,754	+ 1,182
Brazilian Traction (Mrs.)	Apr.	8,330,000	9,208,000	17	35,032,000	+ 3,456,000
Brisbane	Apr.	35,530	38,775	17	151,110	+ 13,561
British Columbia $	Apr.	515,417	631,988	43	6,022,107	+ 1,011,419
Buenos Aires Lacroze	May	41,315	47,317	48	481,503	+ 52,123
Burmah Tram. & Light Rs.	Apr. 30	27,614	36,815	39	325,985	+ 86,230
Calcutta Rs.	June 7	72,740	80,143	22½	..	+ 241,797
Cape Town	Apr.	19,011	22,564	..	..	..
Carthagena and Herrerias	May	5,027	3,226	21	13,418	- 9,167
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	May	1,920	2,131	43	19,679	+ 5,472
Hong Kong $	June 7	72,740	89,143	22½	—	+ 282,575
Kalgoorlie	Feb.	2,373	2,278	8	4,840	— 55
La Plata	May	5,105	5,702	22	29,352	+ 4,274
Lima	Apr.	43,557	49,968	17	92,631	+ 10,652
Lisbon Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	May 31	41,152	45,875	21	364,068	— 39,811
Manaos Rs.	Aug.	150,657	132,507	34	1,152,686	+ 83,969
Manila $	Apr.	163,500	212,638	17	863,383	+ 192,133
Montevideo	May	32,301	37,382	31	265,287	+ 26,949
Para	Apr.	24,745	25,342	21	122,927	+ 3,761
Pernambuco	June 15	4,393	5,763	23½	129,347	+ 29,772
Peruvian $	Feb.	925,410	943,470	34	7,973,845	— 229,195
Port Elizabeth	Apr.	4,028	5,576	...	...	...
Rangoon	May	5,719	6,533	21	32,350	+ 3,763
Shanghai (2 weeks) $	Dec. 11	49,199	52,271	49	1,258,546	+ 67,298
Singapore $	Apr. 26	12,858	14,013	17	267,992	+ 33,837
Toronto $	Apr.	1,065,766	1,051,960	17	4,257,882	+ 28,392
Winnipeg $	Mar.	307,289	384,937	13	1,146,638	+ 205,808

WANTED.

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SATURDAY, JUNE 28, 1919.

THE WAGES OF MANAGEMENT.

A WEEK or two ago there appeared in *The Times* an advertisement from a local authority inviting applications for a position of responsibility at a salary of £150 per annum. At the same time, the labourers in the same department were being paid £3 10s. per week. The case is typical, and represents the relative values assigned to the positions and functions of manager and worker by the social movements at present dominant. The tendency is not only dangerous to society, but it is injuriously unjust to the community. Compare, for example, the relative costs to the community of the manager and the worker. As a rule, the former is an educated man; he has been kept at school till at least sixteen; he may have been trained in a technical college or even a university. At lowest, and in every case, the community has invested a considerable amount of capital in his education and training. On the other hand, the workman is taken from school at 14 years of age, and in a short time is earning a part, if not the whole, of his living. He has cost the community the standard minimum for his education. Under the present system, the salary or wage of a manager or worker is the value set upon their functions. According to the instance cited, the community puts a greater value upon the labourer who has cost it nothing than upon the manager in whose life it has invested money. That is only half of the case, and there remains the question of how much value the community actually derives from the two classes of men. A manual worker may contribute a shilling per hour to the wealth of the community, or even more, but his power of contributing is limited to his own individual case. A man in a responsible position, on the other hand, whether accountant, superintendent, sub-manager, or general manager, is put in charge of large economic units, a small saving upon which may effect a great economy in the aggregate. He may be called to direct labour, and upon the efficiency of his work depends much loss or gain to the community. By refusing to recognise the economic cost and the economic value of the manager, therefore, the community is turning its back upon its most vital interests, and committing a gross injustice. The subject is vast, and it is impossible to do more than touch upon it here. Take, however, the broadest and simplest aspect of the matter. If it is found that a man, by preserving his status as a labourer, and carefully avoiding all signs of ability, by keeping inviolate a dense ignorance of everything excepting food and drink and pleasure, he can obtain a better income than the man who is foolish enough to display ability, and has had the misfortune to be caught in the toils of the educators in high schools and universities, we shall have arrived at the ideal state of the anarchists. No one will aspire to lead, and direction of industry will be a trouble to be avoided at all costs. Possibly it may ultimately become necessary to sentence criminals to managerships instead of penal servitude. The vision is grotesque, but is it greatly at variance with the future promised by the growth of present tendencies?

LONDON TRAFFIC ENQUIRY.

EVIDENCE FOR THE UNDERGROUND GROUP.

The Select Committee of the House of Commons appointed to enquire into transport problems in the metropolitan area resumed its sitting, at the House of Commons on Tuesday, June 24 Mr. Kennedy Jones presided.

Mr. H. A. Vernet, deputy-chairman of the group of companies known as the "combine," appeared in place of Sir Albert Stanley, the chairman of the group directorate, who was absent in the United States. Mr. Vernet described the general nature of the evidence to be submitted and the duties of the officers who would be called.

Mr. Frank Pick, commercial manager of the group, was then called, and submitted evidence showing that, under the London Electric Railway Companies Facilities Act, 1915, an agreement was made by which the Metropolitan District, London Electric, City and South London and Central London Railway Companies, and the London General Omnibus Company, became parties to a common fund which united their several interests. The policy of the group was to seek large numbers of passengers at low rates of fares.

In reply to questions, Mr. Pick claimed that the increases in fares were entirely caused by increases in working expenses. The expenses per cent. of earnings had increased from 47 per cent. in 1913 to 59 per cent. in 1918. If they had charged in 1918 the same fares as were charged in 1914, they would have been over £2,000,000 short. Fares in the congested districts averaged 1.08 mile for a penny, but fares in outlying districts averaged 1.10 mile for a penny. The companies did not go in for "trick" sections. Mr. Pick also explained apparent discrepancies in fare charges on omnibus routes and railways. His company would have no objection to the creation of a central traffic board. At the beginning of the war, the War Office took from them 1,319 omnibuses, leaving 1,766 for London traffic. At the Armistice, there were 2,101 omnibuses working; the number of new omnibuses licensed up to June 18 was 222, and the number of temporary vehicles was 94 lorries and 29 khaki omnibuses. Motor lorries were not popular, and they cost the company 1s. 5d. per mile to run, while earning only about 9d. or 10d. per mile. The new omnibuses would have seating for 46 passengers, as compared with the 34 of the type at present in use. Questioned as to the conference between the London County Council and the traffic combine in 1915, Mr. Pick admitted that their proposal was to limit the pooling arrangement to the South London area, where the tramways did better than the omnibuses, but said they were prepared to extend the arrangement over the whole of London, and the reason for the limitation proposed was that South London lent itself better to the experiment than the North, where there was through running with privately owned cars. Witness did not agree that there was wasteful competition in the streets, for investigation had shown that the omnibuses carried an average of 21 passengers every hour of the day.

At the resumed sitting of the Committee on Wednesday, June 25, Mr. Pick continued his evidence. He stated that an omnibus which cost £682 before the war now cost £1,179, including lighting and all other equipment. The omnibuses were constructed by the Associated Equipment Company, one of the associated companies of the Combine, but while the increase in cost for their work amounted to nearly 100 per cent., the increases charged by outside companies amounted to 200 per cent.

Regarding the abortive negotiations with the London County Council, Mr. Pick dealt with the erroneous impression that it was the Combine which made the proposal limiting the pooling arrangement to South London. The proposal came from a member of the London County Council. Negotiations broke down chiefly over the adjustment of omnibus competition on tramway routes. On the question of taking over from the Government some of the 2,000 new motor chassis available, Mr. Pick pointed to the impossibility of putting omnibus bodies on them. In regard to overcrowding the companies had done their utmost to get rid of it, having put

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359 additional vehicles on to the streets since March, and they were utilising as many "lorry-buses" as they could, though there was a loss on them for every mile run.

Mr. Pick admitted, in reply to a question by Sir F. Hall, that the omnibuses did not arrange for workmen's fares. In order to obtain the same earnings, they would require to carry an average of 46 passengers per hour instead of 22 as at present. The omnibuses could not fall back upon the rates.

Mr. Vernet was called in regard to the question of policy, the chairman suggesting that Mr. Pick had claimed that the Combine was entitled to a legally recognised monopoly. Mr. Vernet replied that they did not want a monopoly of London, but only over the areas they served. He added, "If we had a monopoly, I think we could handle the traffic cheaply and well."

On Thursday M. H. E. Blain, operating manager of the group of companies, submitted evidence as to the traffic conditions and effect of the war on the facilities. He said that last year over 1,000 million passengers were carried by the four underground companies and the London General Omnibus Company. His company was the first company in the country to be affected by the war. With twenty-six hours' notice, omnibuses were withdrawn from service, altered in their factories, and despatched in charge of their own men and officers to Chatham, Dover, and Plymouth. Within a day or two they lost upwards of 3,500 men. From day to day the number of mobilised men increased, and it was only possible to keep the traffic going at all by getting telephonic communication from the garages about 11 p.m. each night and then settling the services that were to be operated the following day. In September, 1914, within 14 hours, 75 omnibuses, equipped with volunteer drivers and kits, were provided for the Antwerp expedition. He thought their idea during the war had been never to consider the question of price when the Government had made a request of any description. The eight-hour day would cost the omnibus undertaking alone £600,000, and that figure would be increased with every additional omnibus put on the streets. While the women conductors had rendered useful service, their value was not the same as that of the men. In view of diminishing accidents, he suggested that the maximum speed of omnibuses should be increased from twelve to sixteen miles per hour.

SEMI-JUBILEE OF GLASGOW TRAMWAYS.

On July 1st Glasgow Corporation Tramways Department will celebrate its 25th anniversary. Its continued development and great success have made the Glasgow Corporation Tramways known throughout the world, and it has served in many respects as a model for other corporations which have during the past quarter of a century established municipal tramways. The Corporation began to operate its tramways on July 1st, 1894. It had previously owned the tracks, but they had been leased to a company, and the Corporation started with fresh horses, cars, buildings, and a new staff. Nothing was taken over from the company, as no agreement as regards price was reached. At that time there was 66 miles of track. To-day the undertaking has 196 miles. The first electric line was opened in October, 1898, and it extended from the centre of the city to Springburn, a distance of 2½ miles. The results of this experiment were so satisfactory that the electrification of the lines was continued, and by the summer of 1901 the electrical equipment of the whole system was completed, and by end of April, 1902, the last horse cars were withdrawn.

DEATH OF MR. W. M. MURPHY.

It is with deep regret that we record the death of Mr. William Martin Murphy chairman of the Dublin United Tramways Co., which took place in Dublin on Thursday. Born at Bantry 75 years ago, he began business life as a contractor, and soon showed that he was possessed of great ability in the directions of finance and industry. He carried out the construction of many tramways and railways, but it is as the creator and guiding spirit of the Dublin United Tramways that he was best known in the tramway world. That system was among the earliest electric undertakings of the kind in the kingdom, and its excellence and success both from the engineering and the financial points of view form testimony to the ability and energy of the man at its head. For some time he was a Nationalist member of Parliament, but his real life work lay in business. In later years as a newspaper proprietor he attacked the old orthodox Nationalists, his sympathies being more with the group associated with Mr. T. M. Healy. In the great labour troubles in Dublin in 1913 and 1914 Mr. Murphy was a prominent figure in fighting the strikers. He fought for his company and for fair dealing, and he won handsomely. He was a director of several railway companies, but amid all his duties he found time for much social and charitable work His position locally is indicated by the fact that he was chairman of the Dublin Chamber of Commerce. He had a fund of sane practical common sense; this, united with his brilliant talents would have made him a conspicuous figure in any community.

B.T.H. Magnetos.—The engines of the flying machines which won the first and second prizes in the Aerial Derby at Hendon on Saturday, June 21, were equipped with B.T.H. magnetos. The first prize was gained by Capt. G. W. Gathergood flying an Airco aeroplane with Napier engine, and the second prize by Lieut. Robert Nisbet, flying a Martynside biplane with Rolls Royce "Falcon" engine. The course measured 190 miles, and was covered by the winner in 87 minutes.

MISCELLANEOUS NEWS AND NOTES.

New Cars Building at Glasgow.—The tramway car works of Glasgow Corporation are turning out a new car every week.

Sunday Traffic in Manchester.—A record in Sunday travelling on Manchester tramways was established on Sunday, June 15, when receipts amounted to over £3,900.

The Melbourne Tramways and Omnibus Company, Ltd., is to be wound up. It will be remembered that the undertaking has been acquired by the municipal authorities.

Improved Service in Nottingham. There has been a further extension of the Nottingham tramway service at night, and pre-war hours have now been practically re-established. Sunday services are, however, to remain as at present.

Motor Omnibus Service for Burnley.—Burnley Corporation are considering the institution of a motor omnibus service between one of the termini and Rawtenstall tramway terminus at Loveclough. Powers would have to be obtained for the purpose.

Threatened Strike at Carlisle.—Notice has been given by the London and Provincial Workers' Union that Carlisle tramway employees will strike unless two inspectors, whose action has been complained of, are dismissed.

Reckless Driving Conviction Affirmed.—A tramway driver who had been fined 10s. for reckless driving appealed at the Belfast Recorder's Court against the conviction, but the Recorder upheld the magistrates decision.

Census of Tramway Passengers. The proposal to take a census of the tramway company's passengers, brought forward at Swansea, has been referred back to the Committee by the Town Council. Several councillors described the proposal as a waste of money, because the information was useless for any practical purpose.

New Tramways Manager at Hull. The Hull Corporation Tramway Committee on Thursday interviewed seven applicants for the managership of the Hull tramway service, and finally selected Mr. E. S. Raynor, M.I.E.E., at present general manager of the Doncaster tramway system. The salary is £800 a year.

Consulting Local Authorities.—At Uxbridge Rural District Council meeting a letter was read from the London United Electric Tramways Company, stating that improvements on the system were being made, and that criticisms and suggestions of a constructive character regarding the tramways in the Council's area would be greatly esteemed.

Passengers' Risks.—An Oldham tramcar starting at a junction, jerked on the points, throwing down a passenger, who claimed damages for injuries. At Oldham County Court, Judge Spencer Hogg held that the passenger had been given reasonable time to get on the car, and that there had been no negligence by the Corporation.

Advancement of Car Conductor.—A Cardiff car conductor, who for bravery in the field was promoted to a commission, has been granted £500 by the War Office in order that he may be trained as an engineer. He is receiving practical instruction at the Cardiff electricity works, and attends the University College for theoretical training.

Alighting off the Wrong End.—At Stratford Police Court, a Walthamstow man was fined 10s. for alighting from a car by other than the conductor's platform at the rear. It was argued by the defendant that, as the car had reached the terminus, the front of the car had automatically become the rear end, but the magistrates did not admit the plea.

American Rails for Glasgow.—The Glasgow Tramways Committee has recommended the acceptance of a tender for 5,000 tons of tramway rails from the United States Steel Products Company. The company has promised earlier delivery than Scottish or English firms could guarantee The price is £17 9s. per ton, while the lowest British offer was £19 1s. 3d. per ton.

Increase in Fares.—Paisley Tramways Company have applied to the Board of Trade for permission to increase fares. It is proposed to abolish the ½d. fare and to make the minimum fare for children 1d. On Sundays and holidays, when increased pay is to be given to the employees, it is proposed to increase the fares by one half, with a minimum of 1d. Maidstone Town Council have applied to the Board of Trade for an order allowing them to increase fares by 50 per cent.

Improved Service on the District Railway.—The Underground Railway authorities have under construction 100 cars of a new type, and have made arrangements for longer trains and an accelerated service, so that all causes for the complaints may be wholly removed. The new cars, which will be fitted with three double sliding doors equally spaced along the side of the coach, will be 9 ft. 6 in. wide and 50 ft. long, as against the length of 49 ft. and 8 ft. 6 in. width of the present cars. During rush hours there will be eight cars in a train, capable of a speed up to 45 miles an hour when working non-stop service. Special attention has been paid to the interior arrangements of the cars, greater gangway room being provided, and the upholstery will be moquette velvet in non-smoking compartments, while the smokers will have seat covers of pegamoid or other washable material. Improved springing has been provided; the cars will be fitted with larger bogies and wheels, which will materially improve running as regards speed and comfort. The stock is constructed of steel throughout, and the small amount of woodwork indispensable has been chemically treated to make it fireproof.

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Demand for Reduced Railway Fares.—At a largely attended demonstration of the National Association of Railway Travellers, held in London, Mr. C. F. Higham, M.P., Mr. H. Bottomley, M.P., and Mr. J. Jones, M.P., voiced the demand that the 50 per cent. war tax on railway fares should be taken off at once. More than 120 members of Parliament are supporting Mr. Higham's campaign.

New Cars for Belfast.—After serious enquiry, Belfast Corporation has fixed upon the type of car best suited to the city tramway traffic conditions. The new cars are designed to carry twelve more passengers than the cars at present in use, will have more powerful motors, and will be capable of hauling a trailer. The Corporation has decided to acquire fifty of these cars at a cost of £2,500 each.

Heavy Penalty for Careless Driving.—In December, 1918, a tramcar belonging to the Lanarkshire Tramways Company ran into a two-horse lorry conveying mineral waters from Hamilton to Glasgow, killing one of the horses and injuring the driver. The man sued the Company for £1,000 damages, and Lord Anderson, in the Court of Session, awarded the pursuer £650 for personal injuries.

Southampton Tramway Service.—Referring to the regretted resignation, owing to ill-health, of Mr. W. T. Robson, general manager of the Southampton Corporation tramways, the *Hampshire Independent* remarks that there is no doubt that the Southampton system is an exceedingly difficult one to manage, owing to its conformation, quite apart from the special burden that was laid upon it by war traffic.

The Penalty of a Clean Face. Dundee Corporation Tramway Committee is encountering the difficulties inherent in their system of workmen's fares, which differentiates between the workman (so-called) and the clerk. A printer's delay in supplying the necessary tickets has aggravated the trouble, but a correspondent of the *Dundee Advertiser*, in reporting an interview with a tramway official on the subject, summed up the problem with the remark, "It certainly seems a pity that one should be penalised for having a clean face."

Southend Reconstruction Delayed.—Alderman Brightwell was seriously disappointed at the recent meeting of Southend District Council. It had been remitted to the Light Railways and Electric Committee of the Council to report on proposals for three new routes of service in the borough. The Committee now reported that the expenditure involved in the proposals was too great, but that, in the meantime, they had instructed the acting surveyor of the borough to communicate with Essex County Council, asking if they would assist the Corporation to widen a street which abuts upon the land belonging to them.

Fatal Fall from Tower Wagon.—A superintendent wireman of the Leicester tramways, who was at work on the platform of a tower wagon putting in a new wire, was fatally injured by falling to the road. At the inquest it was stated that the deceased had been connected with the tramways for fifteen years. There were two men on the platform, 18 ft. from the ground, and as they were putting in a new length of wire the old wire broke, striking them. The deceased fell over the guard and was picked up unconscious. A wireman who gave evidence stated that he had never known a wire to break in the same way before.

No Women Drivers at Blackpool.—The general manager of Blackpool Corporation tramways informs us that the report that a woman has been driving a car at Blackpool which had a male conductor is without foundation. At the present time there are no women employees on the Blackpool traffic staff. We may add that the note in our last issue was based on an item which had appeared in the press, and we regret that its publication in our columns should have given annoyance. The record of Blackpool in connection with the substitution of demobilised soldiers for women workers has been thoroughly creditable, and the Blackpool management has reason to be proud of it.

Policy of Tramway Workers' Union.—Mr. Stanley Hirst, general secretary of the Tramway and Vehicle Workers' Union, has stated that the amalgamation of that body with the London and Provincial Vehicle Workers' Union makes the united membership 80,000. Mr. Hirst has been appointed general secretary of the combined body. One of the first steps will be the application for a minimum wage of £3 15s. per week for all tramway men. It will be the policy of every union attached to the Transport Workers' Federation to avoid indulging in idle threats of strikes, but as far as possible to attain their ends by negotiations in order to preserve industrial peace.

New Cars and Methods at Manchester.—Mr. J. M. McElroy, general manager of Manchester Corporation tramways, in an interview with representatives of the local press, said that there were one hundred new cars under construction. Fifty were being built in the Corporation's own shops and fifty were being built by manufacturers. There were difficulties in the way of early delivery, owing to the shortage of iron and steel. The new cars would have vestibule ends and the whole of the tops would be covered in. Asked whether he thought that vestibule ends would increase the number of accidents, Mr. McElroy said that weighing everything, the balance was in favour of making it possible for the drivers to work in comfort. They had experimented with a car specially built to enable passengers to get on at the back end and get off at the front end on the pavement side. They found that the public did not like it, so they had given up the idea. They were not satisfied with the queue system, and they hoped in the near future to have properly constructed tramway terminals, almost like little stations, where passengers could wait under cover in comfort.

Cost of Current at Dundee.—Mr. G. A. Johnston, convener of the Dundee Tramways Committee, has stated that a new arrangement has been made with the Electricity Committee, under which the tramways department will take over the up-keep of the overhead equipment and pay 1¼d. per unit instead of 1½d. as previously proposed by the Electricity Committee.

Toronto Tramways to be Municipalised.—The employees of the Toronto Street Railway Company recently made certain demands and declined to agree to arbitration. The service was suspended for some days, and motor vehicles and other conveyances were employed to provide transport. A message from the *Times* correspondent at Toronto states that the Ontario Railway Municipal Board will take over and operate the Toronto street railways, Mr. Harris, the City Commissioner of Works, taking charge of the service. The recent demands of the employees will to a large extent be granted, and the additional cost thereby incurred will be adjusted between the city and the company under the arbitration which it is provided shall be held when the franchise expires in 1921. It is expected that the city will acquire the undertaking at that time.

Return of Cardiff Employees. Mr. Arthur Ellis, general manager and engineer of Cardiff Corporation tramways, has reported to the Committee that over 50 women had been released from tramway service since March 31. Last August 200 women were employed, and the number was now 104. At present 52 of their employees were still with the forces. All men who had enlisted had been found some employment on their return, whether incapacitated or not. In addition, the department were training a considerable number of demobilised men who were not previously in their employ. A number of men with artificial limbs had been tried, but they found that the work was too severe and had been obliged to give it up. Owing to the reduction of hours from 54 to 48 per week, more men were still required for training.

Edinburgh Lady Councillor Defends Women Conductors.—At a meeting of the Edinburgh Town Council, the only lady member took the view that while it was only fit and proper for women conductors to give up their jobs to ex-tramway workers who are now demobilised, it was a different thing when women were asked to give up their places to boys of 18 or older men who had never been in the tramway service. She considered that an injustice to the women. She thought also that the women were unfairly treated as regards pay. On appointment a woman conductor receives £2 10s., rising to £2 15s. 3d. after eighteen months' service. Men, on the other hand, received £3 0s. 6d. on appointment, rising to £3 5s. 6d. after eighteen months' service. This is on a basis of 48 hours working week both for men and women. The Tramways Committee promised to consider the appointment of women conductors on the tramway system at an early date.

CONTRACTS AND ORDERS.

Edison Accumulators, Ltd., have received an order from Birmingham Corporation for twenty-five electric dust vans.

Coventry City Council has been recommended to accept tenders for five new cars at £10,908.

Preston Corporation Cleansing Department recommend the acceptance of a tender for two electric vehicles at £2,664.

W. T. Henley's Telegraph Works have an order for cable from Birkenhead Corporation at £864.

The Woods-Gilbert Rail Remodelling Co., Ltd., of 170, Strand, London, W.C., are carrying out another contract with the Isle of Thanet Electric Tramways Company for electrically welding and grinding joints, corrugations and grooves on their rails.

FINANCIAL.

Edgar Allen and Co., Ltd.—After making reserves for contingencies and unascertained liabilities, a net profit of £90,769 is shown. The directors propose to place £20,000 to general reserve and to pay a final dividend of 2s. 6d. per share on the ordinary shares, making 17½ per cent. for the year, free of tax.

L.C.C. Traffic Receipts.—The traffic receipts for the week ended June 25 amounted to £80,575, an increase of £15,665 as compared with the corresponding period last year. The route mileage was 141·67, the same as a year ago. From April 1 (the commencement of the financial year) to June 25 (twelve weeks and two days) the total receipts were £997,004, an increase of £242,507 on the corresponding period of 1918.

Swansea Improvements and Tramways Company. Speaking at the general meeting, Mr. C. G. Tegetmeier (chairman), very clearly summarised the difficulties which tramway undertakings encounter at the present time. The net result of the year's operations, he said, was a decreased profit of £507, notwithstanding an increase in receipts amounting to £12,994. Power and running expenses, administration, repairs and maintenance, and labour had all become more expensive, the prices of stores and materials having advanced by amounts ranging from 100 to 300 per cent., and the additional cost of labour adding about £10,000 per annum to the operating expenditure. The mileage run was approximately the same as in 1914, but the passengers carried numbered four millions more, or an addition of 35 per cent. Overcrowding, therefore, was a natural result. It had been found necessary to increase fares, but the Swansea Company was not yet up to the statutory limit authorised. Rolling stock was being renewed as rapidly as possible, and the considerable reconstructions necessary would be carried out as soon as circumstances permitted.

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Glasgow Corporation Tramways.—The following is a summary statement of revenue and expenditure for the year ended May 31, 1919, with comparative figures for previous years.

Year ended May 31.	1919.	1918.	1917.	1916.	1914.
Traffic receipts	£1,527,487	£1,404,110	£1,245,507	£1,149,264	£1,078,691
Carriage on parcels ..	24	—	—	—	—
Sundry receipts	3,808	8,525	14,607	8,072	5,156
Total revenue	1,531,319	1,412 635	1,260,114	1,157,336	1 083 847
Traffic expenses	674,167	527,152	395,736	350,186	332,546
General expenses ..	174,508	156,949	137,816	144,297	134,034
Carriage on parcels ..	497	—	—	—	—
Maintenance and repairs	219,509	179,811	143,758	133,659	156,214
Power expenses	106,686	86,019	67,231	64,346	53,483
Clydebank bridges ..	1,752	1,132	879	516	—
	1,177,119	951,063	745,420	693,004	676,277
European War ..	72,869	93,120	92,645	80,438	—
Total Expenditure ..	1,249,988	1,044,183	838,065	773,442	676,277
To net revenue account ..	281,331	368,452	422,049	383,894	407,570
Dumbarton tramways	—	—	—	—	180
Interest on investments	10,565	8,580	78,637	81,203	64,809
Total ..	291,896	377,032	500,686	465,097	472,559
Deductions—					
Rent of Paisley lines	9,755	11,119	8,453	6,700	5,830
Interest on capital ..	—	—	78,846	90,474	82,921
Sinking fund	—	—	114,378	109 614	102,607
Income tax	83,702	64,405	64,622	39,853	14,057
Parliamentary expenses	123	61	18	500	609
Renewal and depreciation ..	183,543	123,894	73,305	174,408	212,642
Total ..	277,123	199,479	339,702	421,549	418,626
Surplus to .. common good	14,773	177,553	160,984	43,548	53,893

Leicester Corporation Tramways.—In his report for the year ended December 31, 1918, Mr. A. F. Lucas, manager and secretary of Leicester Corporation Tramways, says that during the year there was an increase in passenger receipts of £46,185, owing to the exceptionally good trade in the town and increased fares. The working expenses had increased by £45,923, due to increased output for power supply, war bonuses to employees, and the higher price of materials. The gross profit amounted to £76,409, as compared with £71,065 in the previous year. After deducting interest, sinking fund, income-tax, and war allowances to employees, there is a net credit balance of £16,497. Mr. T. Robert Smith, electrical engineer and manager, writes that the higher price of fuel and increased wages have again had an adverse influence on the generating costs. The average cost per unit was ·8794d. A comparison of the results for the p st five years is appended :—

	1918.	1917.	1916.	1914.
Traffic revenue	£237,821	£191,636	£175,956	£149,664
Other revenue	£57,095	52,012	10,315	20,571
Total	294,916	£243,648	£216,271	£170,235
Working expenses	218,506	172,583	152,954	118,607
	£76,410	£71,065	£63,317	£51,628
Add bank interest	—	—	157	—
Reserve fund interest	—	—	—	1,660
Gross balance	£76 410	£71,065	£63 474	£53,288
Interest on mortgages, etc. .	25,171	26,028	25,298	24,010
Redemption of debt	16,383	16,573	16,574	13,705
Income-tax	9,627	7,337	7,401	2,801
Bank interest	98	540	—	207
War allowance, reservists, etc.	8,634	11,266	12,044	1,284
Net balance	16,497	9,321	2,157	11,221
	£76,410	£71,065	£63,474	£53,288

From statistics given in the reports the following items have been extracted :—

	1918.	1917.	1916.	1914.
Units per car-mile	1·84	1·95	1·96	1·82
Power cost per car-mile ..	3·732d.	3·203d.	2·574d.	1·480d.
Traffic receipts per track mile..	£6,258	£5,043	£4,630	£4,045
Traffic receipts per car-mile ..	18·993d.	12·025d.	10·279d.	8·682d.
Expenses per car-mile ..	14·072d.	10·830d.	8·935d.	6·880d.
Ratio of expenses to revenue ..	70%	70%	71%	69%
Total track mileage	38	38	38	38
Number of cars in stock ..	160	160	160	160

TRAMWAYS AND OMNIBUS TRAFFIC RETURNS

NAMES.	Week ended	Latest Return. 1918	1919	Incr. or Dec.	Aggregate. Wks.	1919.	Incr. or Dec.
Aberdare U.D.C. ..	June 17	444	638	+ 194	11	5,981	+ 229
Aberdeen Corporation ..	„ 18	2 434	3,304	+ 870	2½	8,624	+ 1,600
Ayr Corporation ..	„ 21	603	716	+ 113	5	3,410	+ 891
Belfast City	„ 20	7,031	10,395	+ 3,364	12	122,759	+ 31,350
Birkenhead Corporation	„ 22	2,053	2,813	+ 760	11½	31,531	+ 6,243
Birmingham Corporation	„ 14	23,523	28,633	+ 5,110	11	284,705	+ 34,578
do. Motor Buses	„ 14	1,479	2,476	+ 996	11	19,293	+ 2,919
Blackburn „ ..	„ 11	2,954	3,317	+ 363	11½	27,343	+ 6,753
Bradford Corporation ..	„ 21	9,168	11,161	+ 1,993	12	136,014	+ 35,776
Burnley Corporation ..	„ 21	2,189	2,920	+ 731	..	..	..
Burton-on-Trent Cor. ..	„ 22	400	486	+ 86	12	5,674	+ 975
Bury Corporation ..	„ 22	1,939	2,529	+ 590	11½	29,560	+ 5,535
Chatham & District ..	„ 12	1,351	2,057	+ 706	23	32,412	+ 3 717
Cork Electric	„ 12	666	758	+ 92	23	13,952	— 355
Derby Corporation ..	„ 21	1,462	2,062	+ 600	12	22,547	+ 4,753
Dundee City	„ 18	1,860	2,650	+ 790	4½	12,012	+ 2,570
East Ham Corporation ..	„ 21	1,535	1,888	+ 353	11½	22,888	+ 6,117
Glasgow Corporation ..	„ 21	28,819	32,917	+ 4,098	3	100,174	+ 10,113
Glossop (U.E. Sup. Co.) ..	„ 21	167	256	+ 89	25	5,609	+ 1,047
Halifax Corporation ..	„ 17	2,452	3,802	+ 1,350	11½	14,343	+ 10,323
do. Motor Buses ..	„ 17	54	86	+ 32	11½	920	+ 235
Huddersfield Corporation	„ 21	3,396	4,768	+ 1,372	12	59,082	+ 14,510
Ilford U.D. Council ..	„ 21	975	1,296	+ 321	12	14,849	+ 3,293
Ipswich Corporation ..	„ 21	702	961	+ 259	12	10 554	+ 2,008
Isle of Thanet ..	„ 18	279	1,473	+ 1,194	37¾	19,113	+ 11,533
Kilmarnock Corporation	„ 21	232	284	+ 52	5¾	1,564	+ 289
Lanarkshire	„ 12	3,696	4,081	+ 385	23	76,171	— 4,068
Leeds City	„ 21	13,296	16,672	+ 3,376	12	202,204	+ 59,662
Leicester Corporation ..	„ 21	4,463	5,987	+ 1,524	..	..	..
Leyton U.D. Council ..	„ 19	2,130	3,259	+ 1,129	12	38,021	+ 13,118
Liverpool Corporation ..	„ 21	18,159	23,473	+ 5,314	24½	529,770	+ 101,566
Llandudno & Colwyn Bay	May 16	367	523	+ 156	24	8,556	+ 1,878
London County Council ..	June 25	64,910	80,575	+ 15,665	12¾	997,004	+ 242,507
Maidstone Corporation ..	„ 19	248	375	+ 127	11¾	4,441	+ 1,183
Manchester Corporation	„ 21	25,023	31,792	+ 6,769	12	365,690	+ 17,779
Newcastle-on-Tyne Cor.	„ 14	9,159	10,242	+ 1,083	11	100,090	+ 3,147
Northampton Cor. ..	„ 20	812	1,289	+ 477	12	15,419	+ 4,857
Nottingham Corporation	„ 14	5,931	7,039	+ 1,108	12	83,278	+ 16,237
Oldham Corporation ..	„ 22	3,444	4,769	+ 1,324	13	57,102	+ 12,129
Reading Corporation ..	„ 19	1,253	1,688	+ 435	11¾	18,258	+ 3.782
Rotherham Corporation	„ 18	2,106	2,351	+ 245	12¾	23,878	+ 2,506
Sheffield Corporation ..	„ 22	13,296	16,524	+ 3,228	12¾	217,325	+ 45,495
Southampton Cor. ..	„ 18	2,439	2,607	+ 368	11¾	31,343	+ 2,822
Southend-on-Sea Cor. ..	„ 11	1,089	3,388	+ 2,299	11	19,912	+ 10,124
South Shields Cor. ..	„ 14	1,129	1,467	+ 337	11	15,057	+ 3,121
Sunderland Corporation..	„ 22	2,009	2,845	+ 836	12	34,977	+ 9,935
Swindon Corporation .	May 14	280	335	+ 55	6¾	2,031	+ 120
Torquay Tramways .	June 12	874	1,451	+ 577	23	20,932	+ 3,142
Tyneside Trys. & Trmrds.	„ 4	1,273	1,131	— 142	23	20,884	— 417
Wallasey Corporation .	„ 21	1,740	2,659	+ 919	11½	30,279	+ 9,008
Walsall Corporation ..	„ 21	1,170	1,288	+ 118	11	16,957	+ 2,422
Walthamstow U.D. Coun.	„ 21	1,457	1,817	+ 360	12	21,856	+ 4 806
Warrington Corporation	„ 19	722	877	+ 155	11	10,307	+ 1,837
West Ham Corporation	„ 19	4,288	5,752	+ 1,464	11¾	61,777	+ 16,005
Wolverhampton .	„ 25	1,722	1 875	+ 153	12	25,166	+ 3,781

FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

NAME.	Week or Month.	Latest Return. 1917-18	1918-19	Aggregate. Wks.	1918-19	Increase or Dec.
Anglo-Argentine	June 17	£55,314	£38,580	24	£1,313,406	+ £16,586
Auckland .. (28 days)	Oct. 26	21,428	22,308	17	92,118	+ 7,322
Ballarat and Bendigo(4 wks)	Apr. 27	4,095	4,291	4	4,291	+ 196
Brazilian Traction (Mlrs.)	Apr.	8,330,000	9,208,000	17	35,032,000	+ 2,456,000
Brisbane	Apr.	35,530	38,775	17	151,110	+ 13,541
British Columbia .. $	Apr	515,417	631,988	43	6,022,107	+ 1,011,419
Buenos Aires Lacroze ..	May	41,315	47,317	48	481,503	+ 52,123
Burmah Tram. & Light Rs.	Apr. 30	27,614	36,815	39	325,985	+ 86,230
Calcutta .. .. Rs.	June 7	72,740	80,143	22½	..	+ 241,797
Cape Town	May	..	23,405	..	..	..
Carthagena and Herrerias	May	5,027	3,226	21	13,418	— 9,167
Cordoba	Feb.	12,972	13,549	48	159,203	+ 11,492
East India	May	1,920	2,131	43	19,679	+ 5,472
Hong Kong.. .. $	May 10	12,082	14,786	19	269 714	+ 1,5586
Kalgoorlie	Feb.	2,373	2,278	8	4,840	— 55
La Plata	May	5,105	5,702	22	29,352	+ 4,274
Lima	Apr.	43 557	49,968	17	92,631	+ 10,652
Lisbon .. .. Escu	Mar.	238,299	276,625	..	..	..
Madras (2 weeks) Rs.	May 31	41,152	45,875	21	364,068	— 39,811
Manaos .. .. Rs.	Aug.	150,657	132,507	34	1,152,686	+ 83,959
Manila .. .. $	Apr.	163,500	212,088	17	863,363	+ 192,133
Montevideo	May	32,301	37,382	31	265,287	+ 26,949
Para	Apr.	24,745	25,342	21	122,927	+ 4,761
Pernambuco	June 22	4,539	5,642	24½	134,989	+ 21,875
Peruvian .. .. $	Feb.	925,410	948,470	34	7,973,885	— 229,195
Port Elizabeth	May	..	5,145	...	...	...
Rangoon	May	5,719	6 533	21	32,350	+ 3,768
Shanghai (2 weeks) $	Apr. 23	50,160	56,755	16	447,279	+ 53,577
Singapore .. .. $	May 17	13,430	14,489	20	311,817	+ 41,351
Toronto .. .. $	Apr.	1,065,766	1,051,960	17	4,257,852	+ 28,392
Winnipeg .. . $	Mar.	307,289	384,937	13	1,146,638	+ 265,808

CARS, MOTORS, CONTROLLERS.

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ENGLISH ELECTRIC COMPANY
LIMITED,
Queen's House, Kingsway,
LONDON, W.C.2.

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THE TRAMWAY & RAILWAY WORLD.
(REGISTERED AS A NEWSPAPER.)
Established in 1892.
PRICE ONE SHILLING.

JANUARY 4, 1919.
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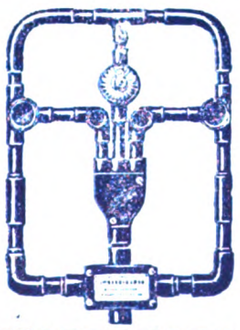
Offices: AMBERLEY HOUSE, NORFOLK STREET
LONDON, W.C.2.
Telegrams: "TRAMGRO, ESTRAND LONDON."
Telephone No. GERRARD 2948.

The Tramway and Railway World Illustrated

A Review of Progress in Electric and other Traction.


TRADE MARK

SIMPLEX CONDUITS LTD.,
Manufacturing Electrical Engineers.
HEAD OFFICE AND WORKS:
GARRISON LANE,—BIRMINGHAM.

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NOTICES.

All Communications and Advertisements for next week's issue should be received not later than noon on Friday.

Advertisements for the next issue, of which proof is desired, should reach us by the second post on Wednesday.

The Editorial and Publishing Offices of "The Tramway and Railway World" are at Amberley House, Norfolk Street, London, W.C.2.

Telegrams: "TRAMIGRO, ESTRAND, LONDON."
Telephone: GERRARD 2948.

TENDERS INVITED.

PORTSMOUTH CORPORATION TRAMWAYS.

Contract.

The Tramways Committee invite Tenders for the supply and delivery of:—

Uniform Clothing for Inspectors, Motormen and Conductors.
Uniform cloth and straw caps for Inspectors, Motormen and Conductors.
Uniform Mackintoshes for Inspectors

for one year.

Specifications and conditions, and Form of Tender may be obtained, and samples may be seen, on application to the General Manager, Town Hall, Portsmouth.

Sealed Tenders, endorsed "Tenders for Uniforms, etc," to be delivered to the Town Clerk, Town Hall, Portsmouth, not later than 12 noon on Monday, 20th January, 1919.

The Committee do not undertake to accept the lowest or any tender and reserve the right to accept the whole or any portion of any tender.

W. R. SPAVEN,
General Manager.

Town Hall, Portsmouth.
December, 1918.

SOUTHEND-ON-SEA CORPORATION.
LIGHT RAILWAYS AND ELECTRIC LIGHTING COMMITTEE.

The Southend-on-Sea Corporation are prepared to receive tenders for the supply of a number of bogie tramcars.

Tender forms and other particulars can be obtained on application to the General Manager, Robert Birkett, Electricity Works, London Road, Southend-on-Sea. Tenders to be addressed to the Town Clerk at the Municipal Buildings, Clarence Road, Southend-on-Sea, not later than January 8th, 1919, endorsed "Tenders for Tramcars."

ROBERT BIRKETT,
Borough Electrical Engineer and General Manager.

December 30, 1918.

POSITIONS VACANT.

Draughtsmen.

First-class Draughtsmen required, with experience in tramcar, motor-bus and char-a-banc work. State age, experience and salary required, and when disengaged.

Box No. 63, THE TRAMWAY AND RAILWAY WORLD, Amberley House, Norfolk Street, London, W.C.2.

SOUTH SHIELDS CORPORATION.

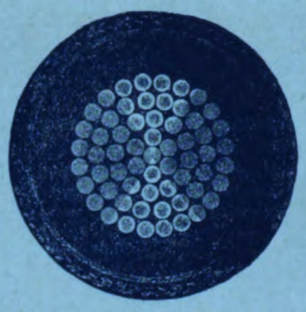
Overhead Linesman.

Wanted, Overhead Linesman. Must be capable of doing all repairs and erection of new equipment. Further particulars on application to J. C. WHITELEY, General Manager and Engineer.

Foreman Overhead Linesman.

Applications for the above position are invited from men with first-class experience on Tramway Maintenance work.—Applications, with particulars of experience, and stating wages required, to GENERAL MANAGER, Rhondda Tramways Co., Ltd., Rheola Road, Porth, Glam.

Electric Tramcar Handbook
FOR
MOTORMEN, INSPECTORS, AND DEPOT WORKERS.
By W. A. AGNEW.
120 Pages, 7 ins. by 4½ ins. Cloth. Price, 2s. 0d. Postage, 2d.
Copies can be obtained from THE TRAMWAY AND RAILWAY WORLD Offices, Amberley House, Norfolk Street, W.C.

1837.  1918.

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TRAMWAY AND OMNIBUS ADVERTISING CONTRACTORS
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Liverpool Corporation Tramways
Edinburgh & District Tramways Company, Ltd.
Belfast City Tramways
Leeds City Tramways
Birmingham Corporation Tramways
Leicester Corporation Tramways
Nottingham Corporation Tramways
Portsdown & Horndean Light Railway Co.
Wakefield & District Light Railway
Londonderry Tramways Company
Calcutta Tramways Company, Ltd.
Cawnpore Electric Tramways
Delhi Electric Tramways
Mandalay Electric Tramways
Dover Corporation Tramways
Newcastle-on-Tyne Corporation Tramways
Cork Electric Tramways and Lighting Co., Ltd.
Isle of Thanet Electric Tramways Company, Ltd.
Keighley Corporation Tramways
Keighley Corporation Motor 'Buses
Burton-on-Trent Corporation Tramways
Scarborough Electric Tramways Co., Ltd.
Aberdeen Suburban Tramways Co.
Paisley & District Tramways Co.
Hastings & District Electric Tramways Co., Ltd.
Gosport and Fareham Tramways Co.
Doncaster Corporation Tramways
Cardiff Corporation Tramways
Plymouth Tramways
Gloucester Corporation Light Railways
Ilkeston Corporation Tramways
Stockport Corporation Tramways
Ilford Council Tramways
Aberdeen Corporation Tramways
Bradford Corporation Tramways
Southampton Corporation Tramways
Halifax Corporation Tramways
Perth Corporation Tramways
Malta Tramways Company
Coventry Corporation Tramways

Head Office:—
AMBERLEY HOUSE, NORFOLK STREET, LONDON, W.C.2.
Telephone: City 7630.

Branch Offices
EDINBURGH—34, St. Andrew's Square.
LIVERPOOL—Princes Buildings, 81, Dale Street.
BIRMINGHAM—147, Corporation Street.
LEEDS—Standard Assurance Buildings, City Square.
NEWCASTLE-ON-TYNE—50, Grey Street.

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Telegraphic Addresses and Telephone Numbers

Of Advertisers whose Announcements appear in the Illustrated Issues of THE TRAMWAY AND RAILWAY WORLD.

NAME OF COMPANY OR FIRM.	ADDRESS.	TELEGRAPHIC ADDRESS.	TELEPHONE NO.
Aerograph Co., Ltd.	43, Holborn Viaduct, London, E.C.1	Aerography, London	Holborn, 2041.
Albion Motor Car Co., Ltd.	Scotstoun, Glasgow	Automobile, Glasgow	Scotstoun, West'n, 1991.
Allen & Co., Ltd., Edgar	Imperial Steel Works, Tinsley, Sheffield	Allen, Sheffield	Sheffield, 917, 265
Allen & Co., Ltd., Edgar (Tramway Dept.)	Imperial Steel Works, Tinsley, Sheffield	Askham, Sheffield, (Tramway and Machinery)	Sheffield, 213.
Allen & Simmonds, Ltd.	Reading, Berks.	Pistons, Reading	Reading, 565.
Anger Manufacturing & Supply Co., Ltd.	Bank Chambers, Preston	Brakjuster, Preston	Preston, 1033
Attwater & Sons	Hopwood Street Mill, Preston	Attwaters, Preston	Preston, 1045 (2 lines)
Austin Motor Co., Ltd.	Longbridge Works, Northfield, Birmingham	Speedily, Northfield	King's Norton, 230, 234.
Auto-Ticket Printing Co., Ltd.	41, Wapping, Liverpool	Extension, Liverpool	Bank, Liverpool, 4646.
Avon India Rubber Co., Ltd.	Melksham, Wilts	Rubber, Melksham	Melksham, 2.
Babcock & Wilcox, Ltd.	30, Farringdon Street, London, E.C.4	Babcock, London	City 6470 (8 lines).
Baker & Co. (Rotherham), Ltd., J.	Brinsworth Iron and Wheel Works, Rotherham	Brinsworth, Rotherham	Rotherham, 89 and 435.
Beckett, Laycock & Watkinson, Ltd.	Willesden, London, N.W.10	Beclawat, London	Willesden, 1558.
Belliss & Morcom, Ltd.	Ledsam Street Works, Birmingham	Belliss, Birmingham	Birmingham, 3044
Bell Punch & Printing Co., Ltd.	52-58, Tabernacle Street, London, E.C.2	Belpunch, Finsquare, London	Central, 7531.
Bennis & Co., Ltd.	Little Hulton, Bolton	Bennis, Little Hulton	Farnworth, 13.
Bowater & Sons, W. V.	159, Queen Victoria Street, London, E.C.4	Sparteolus, London	Bank, 536.
Bridgeport Brass Co.	Broadway and Murray Street, New York, U.S.A.	—	—
Brill Co., J. G.	110, Cannon Street, London, E.C.4	Axles, London	Bank, 6018.
Brimsdown Lead Co., Ltd.	Brimsdown, Middlesex	Hydration, Enfield	Waltham Cross, 132.
Britannia Lamp & Accessories Co., Ltd.	Britannia House, 48, Milton St., London, E.C.2	Aetnaco, Barb, London	City 1257 (2 lines).
British Insulated & Helsby Cables, Ltd.	Prescot, Lancs.	Insulator, Prescot	Prescot, 8.
British Reinforced Concrete Engineering Co.	1, Dickinson Street, Manchester	Brenforce, Manchester	City, Manchester, 8430.
British Thomson-Houston Co., Ltd.	Rugby	Asteroidal, Rugby	Rugby 54 (5 lines)
British Westinghouse Electric & Mfg. Co., Ltd.	Westinghouse Bldg., Norfolk St., London, W.C.2	Multiphase, Estrand, London	Gerrard, 3261 and 2476.
Brockhouse & Co., Ltd.	Victoria Works, Hill Top, West Bromwich	Brockhouse, West Bromwich	West Bromwich, 431.
Brown & Sons, Ltd.	Park Works, Lockwood, Huddersfield	Gearing, Huddersfield	Huddersfield, 1080.
Burford & Co., Ltd., H. G.	11, Waterloo Place, London, S.W.1	—	Regent, 5281.
Chloride Electrical Storage Co., Ltd.	Clifton Junction, nr. Manchester	Chloridic, Pendlebury	Central, Manchester, 1638
Clayton & Co. (Huddersfield), Ltd.	Karrier Works, Huddersfield	Karriakar, Huddersfield	Huddersfield, 1441, 2, 3.
Coan, R. W.	219, Goswell Road, London, E.C.1	Krankases, Isling, London	Central, 4879; City, 3846
Cole & Sons, Ltd., Wm.	235, Hammersmith Road, London, W.6	Imoti, London	Hammersmith, 1414, 1415
Commercial Cars, Ltd.	Biscot Road, Luton	Komerkars, Luton	Luton, 192 and 193.
Courtenay, J. W., Ltd.	Amberley House, Norfolk Street, W.C.2	Tramigro, London	City, 7630.
Coventry Chain Co., Ltd.	Spon End Works, Coventry	Chains, Coventry	Coventry, 830.
Daimler Co., Ltd.	Daimler Works, Coventry	Daimler, Coventry	Coventry, 505.
Dennis Bros. (1913), Ltd.	Onslow Works, Guildford	Dennis, Guildford	Guildford, 129, and 329.

(Continued on page iv.)

TRAMWAY SUPPLIES, Ltd.

Tramway Engineers,

OVERHEAD LINE MATERIALS AND SUPPLIES.

Sole Manufacturers of

TURNER'S PATENT AUTOMATIC POINT CONTROLLERS.

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219, GOSWELL RD., LONDON, E.C.

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*Tin percentage reduced to comply with Committee Regulations. For purposes other than Tramways, our standard Arrow is unchanged.

Fullest particulars of above successful Tramway Metals on application.

For Motor 'Buses we can supply limited quantities of higher grades.

THE HOYT METAL CO., LTD.,

(Works: Millwall, E.) 189, Hammersmith Road, London, W.6.

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Continued from page iii.)

Telegraphic Addresses and Telephone Numbers

Of Advertisers whose Announcements appear in the Illustrated Issues of THE TRAMWAY AND RAILWAY WORLD.

Name of Company or Firm.	Address.	Telegraphic Address.	Telephone No.
Dick & Co., Ltd., W. B.	90, Fenchurch Street, London, E.C.3	Dicotto, London	Avenue, 7854.
Dick, Kerr & Co., Ltd.	Abchurch Yard, Cannon Street, E.C.4	Dicker, Cannon, London	Bank 5866 (4 lines).
Docker Brothers, Ltd.	170, Bishopsgate, London, E.C.2	Matured, London	London Wall, 775.
Dunlop Rubber Co., Ltd.	Manor Mills, Aston, Birmingham	Elastic, Birmingham	Birmingham, East, 123
Electro-Mechanical Brake Co., Ltd.	Eagle Works, West Bromwich	Brakes, West Bromwich	West Bromwich, 291
Equipment & Engineering Co.	Westinghouse Bldg., Norfolk St., London, W.C.2	Kharparts, Estrand, London	City, 1088 (2 lines).
Fleming, Birkby & Goodall, Ltd.	Liversedge, Yorks	Woodfield, Liversedge	Cleckheaton, 103.
Fodens, Ltd.	Sandbach, Cheshire	Foden, Sandbach	Sandbach, 7.
Gabriel & Co.	4 and 5, A. B. Row, Birmingham	Gabriel, Birmingham	Birm'ham, Central, 1223
General Electric Co., Ltd.	67, Queen Victoria Street, London, E.C.4	Polyphase, London	London Wall, 3600
General Seating Co., Ltd.	13, City Road, London, E.C.1	Cushioning, Finsquare, Lond.	London Wall, 6187.
Glasgow Numerical Printing Co.	31, Finnieston Street, Glasgow	Tickets, Glasgow	Glasgow, 5359.
Glenn, J. Barber	Moorgate Station Chambers, London, E.C.2	Octet, Ave., London	London Wall, 262.
Goodrich Co., Ltd., B. F.	117-123, Golden Lane, London, E.C.1	Socketed, Barb, London	City, 5345.
Green & Sons, Ltd., E.	2, Exchange Street, Manchester	Economiser, Manchester	Manchester, 1375
Green & Co. (Feltham), Ltd., Geo. W.	Q-Fel Works, Feltham	Cufel, Feltham	Feltham, 14.
Grover & Co., Ltd.	Carpenters' Road, Stratford, London, E.15	Adopted, Strat., London	Stratford, 984 and 985.
Hadfields, Ltd.	Hecla Works, Sheffield	Hadfield, Sheffield	Sheffield, 750, 2628, & 263
Halley's Industrial Motors, Ltd.	Yoker, Glasgow	Horseless, Glasgow	Clydebank, 196 and 197
Henley's Telegraph Works, Ltd.	13 and 14, Blomfield Street, London Wall, E.C.2	Henletel, Ave., London	London Wall, 4560.
Henley's Tyre & Rubber Co., Ltd.	18, New Union Street, Moorfields, E.C.2	Hetewocol, Ave., London	London Wall, 3886.
Herbert Frood Co., Ltd.	Sovereign Mills, Chapel-en-le-Frith	Friction, Chapel-en-le-Frith	Chapel-en-le-Frith, 19
Hoyt Metal Co., Ltd.	189, Hammersmith Road, London, W.6.	Profanity, Phone London	Hammersmith, 1702.
Hurst, Nelson & Co., Ltd.	Motherwell, Scotland	Nelson, Motherwell	Motherwell, 44.
Johnson & Phillips, Ltd.	Charlton, London, S.E.7	Juno, Charlton, London, S.E.	Greenwich, 400.
Kalker & Co., E.	23, Much Park Street, Coventry	Kalker, Coventry	Coventry, 24X.
Kearsley & Co., Ltd., Robt.	Ripon, Yorks	Kearsley, Ripon	Ripon, 5.
Laere Motor Car Co., Ltd.	78, York Road, King's Cross, London, N.1	Unbaffled, London	North, 2708.
Leyland Motors, Ltd.	Leyland, Lancs	Leymotors, Leyland	Leyland, 37.
Lorain Steel Co.	36-38, New Broad Street, London, E.C.2	Thoughtful, London	London Wall, 8186.
Macintosh & Co., Ltd., Chas.	Cambridge Street, Manchester	Macintosh, Manchester	Manchester, Central, 7147
Magnolia Anti-Friction Metal Co., Ltd.	49, Queen Victoria Street, London, E.C.4	Magnolier, Cannon, London	City, 6596.
Maudslay Motor Co., Ltd.	Parkside, Coventry	Maudslay, Coventry	Coventry, 110.
Mirrlees Watson Co., Ltd.	Scotland Street, Glasgow	Mirrlees, Glasgow	South Side, 1781.
Motor Rail and Tram Car Co., Ltd.	79, Lombard Street, London, E.C.3	—	Avenue, 1777.
Motor Traction	20, Tudor Street, London, E.C.4	Autocars, Fleet, London	City, 2848
Municipal Tramways Association	7, Hall Ings, Bradford	Tramways, Bradford	Bradford 2381.
Napier & Son, Ltd., D.	14, New Burlington Street, London, W.1	Nitrifier, Reg., London	Gerrard, 8926.
North British Rubber Co., Ltd.	Castle Mills, Edinburgh	Weba, Edinburgh	Edinburgh, Central 3880
Pease & Partners, Ltd.	Tees Ironworks, Middlesbrough	Pease, Middlesbrough	Middlesbrough, 917.
Pinchin, Johnson & Co., Ltd.	Minerva House, 26-27, Bevis Marks, London, E.C.3	Pinchin, Ald., London	Avenue, 910.
Ransomes, Sims & Jefferies, Ltd.	Orwell Works, Ipswich	Ransomes, Ipswich	Ipswich, 12.
Rail Welding Co.	110, Victoria Street, London, S.W.1	Weltrajont, Sowest, London	Victoria, 1363.
Scholey & Co., Ltd.	56, Victoria Street, London, S.W.1	Scolanco, Sowest, London	Victoria, 6663 (2 lines)
Shrewsbury & Challiner Tyre Co., Ltd.	Kay Street, Ardwick Green, Manchester	Challiner, Manchester [dale	Manchester, Central, 062
Siemens Brothers Dynamo Works, Ltd.	38 & 39, Upper Thames Street, London, E.C.4	Siemotor, Cent., London	City 5350 (9 lines).
Simplex Conduits, Ltd.	Garrison Lane, Birmingham	Economy, Birmingham	Victoria, Birmingham, 535
Simplex Rubber Co., Ltd.	Scrubbs Lane, Willesden, London, N.W.	Simplexine, Kensal, London	Willesden, 550.
Skefko Ball Bearing Co., Ltd.	Shefko Works, Luton	Skefko, Luton	Luton, 418.
Smith & Co., Frederick	Anaconda Works, Salford, Manchester	Anaconda, Manchester	Manchester, 2334.
Smith & Sons (M. A.), Ltd.	179-185, Great Portland Street, London, W.1	Speedomile, Telew, London	Mayfair 6250.
Smith Bros. & Hill, Ltd.	Albion Tramway Spring Works, West Bromwich	Springs, Westbromwich	West Bromwich, 125.
Spencer, Moulton & Co., Ltd., George	239, Deansgate, Manchester	Solspen, Manchester	Manchester City, 5180.
Standard Underground Cable Co.	Dock House, Billiter Street, London, E.C.3	Gramercy, London	Avenue, 5463
Stevens Petrol-Electric Vehicles, Ltd.	82, Victoria Street, London, S.W.1	Stemobile, Sowest, London	Victoria 5086.
Stewarts & Lloyds, Ltd.	41, Oswald Street, Glasgow	Lapweld, Glasgow	Glasgow, City, 9880.
Straker-Squire, Ltd.	Nelson Square, Blackfriars, London, S.E.1	Rhomboidal, London	Hop, 369 and 370.
"The Coventry" Chain Co., Ltd.	Spon End Works, Coventry	Chains, Coventry	Coventry, 830.
Terry & Sons, Ltd., Herbert	Redditch	Springs, Redditch	Redditch, 61.
Thermit, Ltd.	675, Commercial Road, London, E.14.	Fulmen, Phone London	East, 4157.
Thornycroft & Co., Ltd.	10, Grosvenor Place, London, S.W.1	Thornycroft, London	Victoria, 8000.
Tilling-Stevens, Ltd.	Victoria Works, Maidstone	Tilling-Stevens, Maidstone	Maidstone, 117.
Tilan Trackwork Co., Ltd.	Rutland Road, Sheffield	Crossings, Sheffield	Sheffield, Central, 798
Tramways and Light Railways Association	Sanctuary Chambers, Tothill St., London, S.W.1	Tralitrayl, Vic., London	Victoria, 2110.
Tramway and Railway World	Amberley House, Norfolk Street, W.C.2	Tramigro, London	Gerrard, 2948.
Tramway Supplies, Ltd.	160, Woodhouse Lane, Leeds	Controller, Leeds	Leeds, 26883
Triplex Safety Glass Co., Ltd.	1, Albemarle Street, London, W.1	—	Regent, 1340.
Tudor Accumulator Co., Ltd.	3, Central Buildings, London, S.W.1	Subconical, London	Victoria, 2600.
Tyne Metal Co., Ltd.	Hexham-on-Tyne	Floating, Hexham	Hexham, 189.
Underground Electric Railways Co.	Electric Railway House, London, S.W.1	Underneath, Vic., London	Victoria, 6800.
United Electric Car Co., Ltd.	Preston, Lancs	Prescar, Preston	Preston, 219 and 220.
Val de Travers Asphalte Paving Co., Ltd.	Hamilton House, Bishopsgate, London, E.C.2	Traversable, Ave., London	London Wall, 7467.
Vandervell & Co., Ltd., C. A.	Warple Way, Acton, London, W.3.	Vanteria, London	Chiswick, 2000 (8 lines)
Vislok, Ltd.	3, St. Bride's House, London, E.C.4	—	Central, 8157.
Waygood-Otis, Ltd.	Falmouth Road, London, S.E.1	Waygood, Sedist, London	Hop, 4000.
Wells, A. C., & Co.	102-104, Midland Road, St. Pancras, N.W.1	Unbreakable, Kincross, Lond.	North, 341
White Motors & Accessories, Ltd.	Concanon Road, Brixton, London, S.W.2	Genisean, London	Brixton, 565 and 566
Williamson, Alfred	North Mill Printing Works, Ashton-under-Lyne	—	Ashton-under-Lyne, 320.
Wiseman, Ltd., Alfred	Glover Street, Birmingham	Verus, Birmingham	Victoria, B'ham, 560 & 561
Wood-Milne, Ltd.	21, Albion Street, Gaythorn, Manchester.	Wudmiln, Manchester	Manchester City, 8774.
Youngs	Ryland Street Works, Birmingham	Oldens, Birmingham	Midland, 301.
Zenith Carburetter Co., Ltd.	40-42, Newman Street, London, W.1	Zenicarbur, Ox, London,	Regent, 4812 and 4813

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The Offices of THE TRAMWAY AND RAILWAY WORLD are at Amberley House, Norfolk Street, London, W.C.2.

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LONDON, W.C.2

Telegrams: "TRAMIGRO, ESTRAND LONDON."
Telephone No. GERRARD 2948.

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JUL 25 1919

The Tramway and Railway WORLD

ILLUSTRATED

A REVIEW OF PROGRESS IN Electric AND OTHER Traction.

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TUBES AND FITTINGS FOR ELECTRIC WIRING. STEEL PLATES FOR BOILERS, BRIDGES, Etc. STEEL CASTINGS.

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NOTICES.

All Communications and Advertisements for next week's issue should be received not later than noon on Friday.

Advertisements for the next issue, of which proof is desired should reach us by the second post on Wednesday.

The Editorial and Publishing Offices of "The Tramway and Railway World" are at Amberley House, Norfolk Street, London, W.C.2.

Telegrams: "TRAMIGRO, ESTRAND, LONDON."
Telephone: GERRARD 2948.

TENDERS INVITED.

BOROUGH OF GRAVESEND ELECTRICITY DEPARTMENT.

The Gravesend Corporation are prepared to receive Tenders for Plant to the following Specifications:—

SECTION A.—One 2,000 KW. Steam Turbine with 6,000/6,600 volt, three-phase alternator, to be delivered and erected on purchasers' foundations.

SECTION B.—Condensers with motor-driven air and circulating Water Pumps, to be delivered and erected on purchasers' foundations.

Copies of the Specifications, Conditions and Forms of Tender can be obtained from the undersigned on payment of a deposit of One Guinea, which will be returned provided a *bona-fide* tender has been received and not withdrawn. Duplicate copies of the Specification can be obtained on payment of 5s. each, which will not be returned.

Tenders, sealed and endorsed "Tender for Electricity Works Extensions," must be addressed to the Town Clerk, Municipal Offices, Woodville Terrace, Gravesend, and delivered on or before Saturday, July 12.

C. F. McINNES, M.I.E.E.,
Borough Electrical Engineer.

Electricity Works Gravesend.
July 18, 1919.

GREAT WESTERN RAILWAY.

The Directors of this Company are prepared to receive Tenders for the Supply of the Undermentioned Stores from the 1st of July, 1919, to the 31st of December, 1919:

1.—Laminated Springs.
2.—Helical and Volute Springs.
3.—Steel Tyres.
4.—Steel Axles and Forgings.
5.—Iron Plates and Bars.
6.—Steel Plates and Sheets.
7.—Steel Bars and Blooms.
8.—Steel Castings (Wheel Centres and Bosses).
9.— Do. (Miscellaneous).
11.—Chain and Special Iron for Chain Manufacture.
12.—Tubes and Fittings.
13.—Solid Drawn Steel Tubes.
14.—Cast-iron Socket Pipes, Lamp Posts, etc.
15.—Galvanised Sheets.
16.—Tool Steel.

Specifications and Forms of Tender (upon which alone tenders will be received) may be obtained on application to the Stores Superintendent at Swindon.

Tenders, addressed to the undersigned, and marked outside "Tender for Iron and Steel," will be received on or before Tuesday, the 8th July.

Th Directors do not bind themselves to accept the lowest or any Tender.

A. E. BOLTER,
Secretary.

Paddington Station, London,
20th June, 1991.

BOROUGH OF BEDFORD.

Electricity Department.

Tenders are invited from Manufacturers for the Supply, Delivery and Erection of the following Plant:—

Contract No. 1.—1-1,500 K.W. Single Phase Turbo Alternator and Condensing Plant.
Contract No. 2.—Water Tube Boilers, Superheaters, Mechanical Stokers and Induced Draught Plant.
Contract No. 3.—Extra High Tension Switch Gear.
Contract No. 4.—Water Softener, Feed Water Heater and Storage Tanks.
Contract No. 5.—Water Measuring Apparatus.
Contract No. 6.—Feed Pumps.

Specifications and full particulars may be obtained from the undersigned on receipt of a deposit of £1 in respect of each Contract. Deposits will be returned on receipt of bona-fide Tenders.

Sealed Tenders, endorsed "Contract No. ——," addressed to the Chairman of the Electricity Committee, Electricity Works, Cauldwell Road, Bedford, are to be delivered before noon on Monday, 14th July, 1919.

The Corporation does not bind itself to accept the lowest or any Tender.

(Signed) R. W. L. PHILLIPS,
Borough Electrical Engineer

POSITIONS VACANT.

BOROUGH OF PLYMOUTH.

Tramways Manager.

Applications are invited from qualified persons for the appointment of Tramways Manager of the Plymouth Corporation Tramways.

Candidates to have experience as engineer and manager of a tramways undertaking.

The person appointed will be required to devote the whole of his time to the duties of the office.

The engagement will be during the pleasure of the Council, and capable of determination by three months' notice on either side at any time.

The duties to include—management of the building, and repairing of car bodies, trucks, and electrical equipment, the construction and maintenance of the permanent way and overhead lines, together with the control of the whole of the employees of the tramways department, including the administrative staff.

The salary will be £700 per annum, rising by annual increments of £50 to £800.

Applications, stating qualifications, age and particulars of present and past appointments, accompanied by copies of three recent testimonials, must be sent to the undersigned, endorsed "Tramways Manager," not later than noon on Wednesday, the 23rd July, 1919.

Twenty copies of applications and testimonials may be sent to the undersigned for the use of members of the Committee.

Canvassing direct or indirect is prohibited

Dated this 21st day of June, 1919.

R. J. FITTALL,
Town Clerk.

Municipal Offices, Plymouth.

TRAMWAY RUNNING SHED.

Foreman Wanted.

To take charge of a small running shed on North East Coast. Applicant should have sound general knowledge of maintenance work to electrical equipment and trucks. Wages £5 10s. per week. Reply to "A," Box 58, THE TRAMWAY AND RAILWAY WORLD. Amberley House, Norfolk Street, London, W.C.2.

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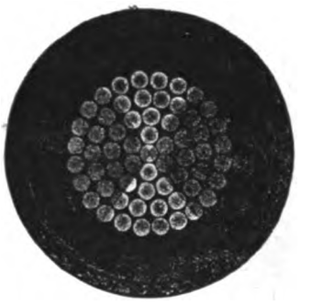
Erith Council Tramways,
Walnut Tree Road,
Erith, Kent.

1837.  1918.

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Telegraphic Addresses and Telephone Numbers

Of Advertisers whose Announcements appear in the Illustrated Issues of THE TRAMWAY AND RAILWAY WORLD.

NAME OF COMPANY OR FIRM.	ADDRESS	TELEGRAPHIC ADDRESS.	TELEPHONE No.
Aerograph Co., Ltd.	43, Holborn Viaduct, London, E.C.1	Aerography, London	Holborn, 2041.
Albion Motor Car Co., Ltd.	Scotstoun, Glasgow	Automobile, Glasgow	Scotstoun, West'n, 1991.
Allen & Co., Ltd., Edgar	Imperial Steel Works, Tinsley, Sheffield	Allen, Sheffield	Sheffield, 917, 265.
Allen & Co., Ltd., Edgar (Tramway Dept.)	Imperial Steel Works, Tinsley, Sheffield	Askham, Sheffield, (Tramway and Machinery)	Sheffield, 213.
Allen & Simmonds, Ltd.	Reading, Berks.	Pistons, Reading	Reading, 565.
Alloy Welding Processes, Ltd.	149, Leadenhall Street, London, E.C.3	—	Avenue, 5733.
Anger Manufacturing & Supply Co., Ltd.	Bank Chambers, Preston	Brakjuster, Preston	Preston, 1033
Armstrong, Stevens & Son, Ltd.	Whittall Street, Birmingham	Armstrongs, Birmingham	Birmingham, 6148.
Associated Equipment Co.	Blackhorse Lane, Walthamstow E. 17	Vangastow, Waltstreet, London	Walthamstow, 780 (8 lines).
Attwater & Sons	Hopwood Street Mill, Preston	Attwaters, Preston	Preston, 1045 (2 lines).
Austin Motor Co., Ltd.	Longbridge Works, Northfield, Birmingham	Speedily, Northfield	King's Norton, 230-234.
Auto-Ticket Printing Co., Ltd.	41, Wapping, Liverpool	Extension, Liverpool	Bank, Liverpool, 4646.
Avon India Rubber Co., Ltd.	Melksham, Wilts	Rubber, Melksham	Melksham, 2.
Babcock & Wilcox, Ltd.	30, Farringdon Street, London, E.C.4	Babcock, London	City 6470 (8 lines).
Baker & Co. (Rotherham), Ltd., J.	Brinsworth Works, Rotherham	Brinsworth, Rotherham	Rotherham, 89 and 435.
Beckett, Laycock & Watkinson, Ltd.	Willesden, London, N.W.10	Beclawat, London	Willesden, 1558.
Bell Punch & Printing Co., Ltd.	52-58, Tabernacle Street, London, E.C.2	Belpunch, Finsquare, London	Central, 7531.
Bennis & Co., Ltd.	Little Hulton, Bolton	Bennis, Little Hulton	Farnworth, 13.
Bridgeport Brass Co.	Bridgeport, Conn., U.S.A.	—	—
Brill Co., J. G.	110, Cannon Street, London, E.C.4	Axles, London	Bank, 6018.
Brimsdown Lead Co., Ltd.	Brimsdown, Middlesex	Hydration, Enfield	Waltham Cross, 132.
Britannia Lamp & Accessories Co., Ltd.	Britannia House, 48, Milton St., E.C.2	Aetnaco, Barb, London	City 1257 (2 lines)
British Aluminium Co., Ltd.	106, Queen Victoria Street, E.C.4	Cryolite Cent., London	City, 2672.
British Insulated & Helsby Cables, Ltd.	Prescot, Lancs.	Insulator, Prescot	Prescot, 8
British Reinforced Concrete Engineering Co.	1, Dickinson Street, Manchester	Brenforce, Manchester	City, Manchester, 8430
British Thomson-Houston Co., Ltd.	Rugby	Asteroidal, Rugby	Rugby 54 (5 lines).
British Westinghouse Electric & Mfg. Co., Ltd	Westinghouse Bldg., Norfolk St., W.C.2	Multiphase, Estrand, London	Gerrard, 3261 and 2476
Brockhouse & Co., Ltd.	Victoria Works, Hill Top, West Bromwich	Brockhouse, West Bromwich	West Bromwich, 431.
Brown & Sons, Ltd.	Park Works, Lockwood, Huddersfield	Gearing, Huddersfield	Huddersfield, 1080.
Callender's Cable and Construction Co. Ltd.	Hamilton Ho. Victoria Embankment, E.C.4	Callender, Fleet, London	Holborn, 1910.
Chamberlins, Ltd.	Botolph Street, Norwich	Chamberlins, Norwich	Norwich, 1042.
Chloride Electrical Storage Co., Ltd.	Clifton Junction, nr. Manchester	Chloridic, Pendlebury	Central, Manchester, 1645
Clayton & Co. (Huddersfield), Ltd.	Karrier Works, Huddersfield	Karriakar, Huddersfield	Huddersfield, 1441, 2, 3.
Coan, R. W.	219, Goswell Road, London, E.C.1	Krankases, Isling, London	Central, 4879 : City, 3846
Cole & Sons, Ltd., Wm.	235, Hammersmith Road, London, W.6	Imoti, London	Hammersmith, 1414, 1415
Commercial Cars, Ltd.	Biscot Road, Luton	Komerkars, Luton	Luton, 192 and 193.

(*Continued on page iv.*)

J. W. COURTENAY, Ltd.

TRAMWAY AND OMNIBUS ADVERTISING CONTRACTORS

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Liverpool Corporation Tramways
Edinburgh & District Tramways Company, Ltd.
Belfast City Tramways
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Leicester Corporation Tramways
Nottingham Corporation Tramways
Portsdown & Horndean Light Railway Co.
Wakefield & District Light Railway
Londonderry Tramways Company
Calcutta Tramways Company, Ltd.
Cawnpore Electric Tramways
Delhi Electric Tramways
Mandalay Electric Tramways
Dover Corporation Tramways
Newcastle-on-Tyne Corporation Tramways
Cork Electric Tramways and Lighting Co., Ltd.
Isle of Thanet Electric Tramways Company, Ltd.
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Burton-on-Trent Corporation Tramways
Scarborough Electric Tramways Co., Ltd.
Aberdeen Suburban Tramways Co.
Paisley & District Tramways Co.
Hastings & District Electric Tramways Co., Ltd.
Gosport and Fareham Tramways Co.
Doncaster Corporation Tramways
Cardiff Corporation Tramways
Plymouth Tramways
Gloucester Corporation Light Railways
Ilkeston Corporation Tramways
Stockport Corporation Tramways
Ilford Council Tramways
Aberdeen Corporation Tramways
Bradford Corporation Tramways
Southampton Corporation Tramways
Halifax Corporation Tramways
Perth Corporation Tramways
Malta Tramways Company
Coventry Corporation Tramways

Head Office:—
AMBERLEY HOUSE, NORFOLK STREET, LONDON, W.C.2.
Telephone: City 7630.

Branch Offices
EDINBURGH—34, St. Andrew's Square.
LIVERPOOL—Princes Buildings, 81, Dale Street.
BIRMINGHAM—147, Corporation Street.
LEEDS—Standard Assurance Buildings, City Square.
NEWCASTLE-ON-TYNE—50, Grey Street.

TRAMWAY SUPPLIES, Ltd.

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Telegrams: KRANKASES, ISLING, LONDON.

219, GOSWELL RD., LONDON, E.C.

Telephones: 3846 CITY. 4879 CENTRAL

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Continued from page iii.)

Telegraphic Addresses and Telephone Numbers

Advertisers whose Announcements appear in the Illustrated Issues of "The Tramway and Railway World."

Name of Company or Firm.	Address.	Telegraphic Address.	Telephone No.
Courtenay, J. W., Ltd.	Amberley House, Norfolk Street, W.C.2	Tramigro, London	City, 7030.
Cros, Ltd., W. & G. du	Acton, London, W.3.	Voiturante, Phone, London	Chiswick, 800.
Daimler Co., Ltd.	Daimler Works, Coventry	Daimler, Coventry	Coventry, 505.
Dennis Bros. (1913), Ltd.	Onslow Works, Guildford	Dennis, Guildford	Guildford, 575 (4 lines).
Dick & Co., Ltd., W. B.	90 Fenchurch Street, London, E.C.3	Dicotte, London	Avenue, 7854.
Dick, Kerr & Co., Ltd.	Queen's House, Kingsway, London, W.C.2	Dicker, Cannon, London	Holborn, 830.
Docker Brothers, Ltd.	170, Bishopsgate, London, E.C.2	Matured, London	London Wall, 775 [935
Dodson Ltd., Christopher	Cobbold Road, Willesden, London, N.W.	Creedolim, Sowest, London	Willesden 1630 (3 lines)
Dunlop Rubber Co., Ltd.	Manor Mills, Aston, Birmingham	Elastic, Birmingham	Birmingham, East, 123.
Edison Swan Electric Co., Ltd.	Ponders End, Middlesex	Ediswan, Enfield	Enfield, 520.
Electro-Mechanical Brake Co., Ltd.	Eagle Works, West Bromwich	Brakes, West Bromwich	West Bromwich, 291
English Electric Co. Ltd.	Queen's House, Kingsway, London, W.C. 2	—	Holborn, 830
Equipment & Engineering Co.	Westinghouse Bldg., Norfolk St., London, W.C.2	Kharparts, Estrand, London	City, 1088 (2 lines.
Fleming, Birkby & Goodall, Ltd.	Liversedge, Yorks	Woodfield, Liversedge	Cleckheaton, 103.
Fodens, Ltd.	Sandbach, Cheshire	Foden, Sandbach	Sandbach, 7.
Gabriel & Co.	4 and 5, A. B. Row, Birmingham	Gabriel, Birmingham	Birm'ham, Central 1223.
General Electric Co., Ltd.	67, Queen Victoria Street, London, E.C.4	Polyphase, London	London Wall, 3600
General Seating Co., Ltd.	13, City Road, London, E.C.1	Cushioning, Finsquare, Lond	London Wall, 6187
Glasgow Numerical Printing Co.	31, Finnieston Street, Glasgow	Tickets, Glasgow	Glasgow, 5350.
Glenn, J. Barber	Moorgate Station Chambers, London, E.C.2	Octet, Ave., London	London Wall, 262
Green & Sons, Ltd., E.	2, Exchange Street, Manchester	Economiser, Manchester	Manchester, 1375
Green & Co. (Feltham), Ltd., Geo. W.	Q-Fel Works, Feltham	Cufel, Feltham	Feltham, 14.
Grover & Co., Ltd.	Carpenters' Road, Stratford, London, E.15	Adopted, Strat., London	Stratford, 984 and 985.
Hadfields, Ltd.	Hecla Works, Sheffield	Hadfield, Sheffield	Sheffield, 750, 2628, & 263.
Halley's Industrial Motors, Ltd.	Yoker, Glasgow	Horseless, Glasgow	Clydebank, 196 and 197
Hanley's Telegraph Works, Ltd.	13 and 14, Blomfield Street, London Wall, E.C.2	Henletel, Ave., London	London Wall, 4560.
Hanley's Tyre & Rubber Co., Ltd.	18, New Union Street, Moorfields, E.C.2	Hetewocol, Ave., London	London Wall, 3886.
Herbert Frood Co., Ltd.	Sovereign Mills, Chapel-en-le-Frith	Friction, Chapel-en-le-Frith	Chapel-en-le-Frith, 1.
Hoyt Metal Co. of Great Britain, Ltd.	Deodar Road, Putney, London, S.W.15.	Profanity, Phone, London	Putney, 1323 and 1324.
Hughes, Bolckow & Co., Ltd.	Battleship Wharf, Blyth	—	—
Hurst, Nelson & Co., Ltd.	Motherwell, Scotland	Nelson, Motherwell	Motherwell, 44.
Johnson & Phillips, Ltd.	Charlton, London, S.E.7	Juno, Charlton, London, S.E.	Greenwich, 400.
Kalker & Co., E.	23, Much Park Street, Coventry	Kalker, Coventry	Coventry, 24X.
Kearsley & Co., Ltd., Robt.	Ripon, Yorks	Kearsley, Ripon	Ripon, 5.
Leare Motor Car Co., Ltd	78, York Road, King's Cross, London, N.1	Unbaffled London	North, 2708.
Leyland Motors, Ltd.	Leyland, Lancs	Leymotors, Leyland	Leyland, 37.
Lorain Steel Co.	36-38, New Broad Street, London, E.C.2	Thoughtful, London	London Wall, 8180.
Macintosh & Co., Ltd., Chas.	Cambridge Street, Manchester	Macintosh, Manchester	Manchester, Central, 7147
Macintosh Cable Co., Ltd.	Ashbourne Road Mills, Derby	Macintosh, Eerby	Derby, 1200.
Magnolia Anti-Friction Metal Co., Ltd.	49, Queen Victoria Street, London, E.C.4	Magnolier, Cannon, London	City, 6596.
Maudslay Motor Co., Ltd.	Parkside, Coventry	Maudslay, Coventry	Coventry, 110.
Midland Rubber Co., Ltd.	Ryland Street, Birmingham	Mirco, Birmingham	Midland, 453.
Mirrlees Watson Co., Ltd.	Scotland Street, Glasgow	Mirrlees, Glasgow	South Side, 1781
Motor Traction	20, Tudor Street, London, E.C.4	Autocars, Fleet, London	City, 2848
Municipal Tramways Association	32, Blackfriars Street, Salford	Tramways, Salford	Central, 5367
Napier & Son, Ltd., D.	14, New Burlington Street, London, W.1	Nitritier, Reg., London	Gerrard, 8926.
North British Rubber Co., Ltd.	Castle Mills, Edinburgh	Weba, Edinburgh	Edinburgh, Central, 3880
Pease & Partners, Ltd.	Tees Ironworks, Middlesbrough	Pease, Middlesbrough	Middlesbrough, 917.
Pinchin, Johnson & Co., Ltd.	Minerva House 26-27, Bevis Marks, London, E.C.3	Pinchin, Ald., London	Avenue, 910.
Rail Welding Co.	119, Victoria Street, London, S.W.1.	Weltrajont, Sowest, London	Victoria, 1363.
Railless, Ltd.	56, Moorgate Street, London, E.C2.	Skrailless, Phone, London	London Wall, 9080
Scholey & Co., Ltd.	56, Victoria Street, London, S.W.1	Scolanco, Sowest, London	Victoria, 6663 (2 lines).
Shrewsbury & Challiner Tyre Co., Ltd.	Kay Street, Ardwick Green, Manchester	Challiner, Manchester [dale	Manchester, Central, 962.
Skefko Ball Bearing Co., Ltd.	Skefko Works, Luton	Skefko, Luton	Luton, 418.
Smith & Co., Frederick	Anaconda Works, Salford Manchester	Anaconda, Manchester	Manchester, 2334.
Smith & Sons (M. A.), Ltd.	179-185 Great Portland Street, London, W.1	Speedomile, Telew, London	Mayfair 6250.
Smith Bros. & Hill, Ltd.	Albion Tramway Spring Works, West Bromwich	Springs, Westbromwich	West Bromwich, 125.
Spencer, Moulton & Co., Ltd., George	42, Wigmore Street, London, W.1	c/o Wudmiln, London	Mayfair, 6789
Springvale Engineering Works	Blythe Road, West Kensington, London, W.14.	Esveelle, Phone, London	Hammersmith, 1166
Standard Underground Cable Co.	Dock House, Billiter Street, London, E.C.3	Gramercy, London	Avenue, 5463.
Stevens Petrol-Electric Vehicles, Ltd.	82, Victoria Street, London, S.W.1	Stemobile, Sowest, London	Victoria 5086.
Stewarts & Lloyds, Ltd.	41, Oswald Street, Glasgow	Lapweld, Glasgow	Glasgow, City, 9880.
Straker-Squire, Ltd.	Nelson Square, Blackfriars, London, S.E.1	Rhomboidal, London	Hop, 369 and 370
"The Coventry" Chain Co., Ltd.	Spon End Works, Coventry	Chains, Coventry	Coventry, 830.
Terry & Sons, Ltd., Herbert	Redditch	Springs, Redditch	Redditch, 61.
Thermit, Ltd.	675, Commercial Road, London, E.14.	Fulmen, Phone London	East, 4157.
Thornycroft & Co., Ltd.	10, Grosvenor Place, London, S.W.1	Thornycroft, London	Victoria, 8000
Tilling-Stevens, Ltd.	Victoria Works, Maidstone	Tilling-Stevens, Maidstone	Maidstone, 117.
Titan Trackwork Co., Ltd.	Rutland Road, Sheffield	Crossings, Sheffield	Sheffield, Central, 798
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Tyne Metal Co., Ltd.	Hexham-on-Tyne	Floating, Hexham	Hexham, 189.
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Vandervell & Co., Ltd., C. A.	Acton, London, E.C.4	Vanteria, London	Chiswick, 2000 (8 lines).
Waygood-Otis, Ltd.	Falmouth Road, London, S.E.1	Waygood, Sedist, London	Hop, 4000.
Western Electric Co., Ltd.	North Woolwich, E.	Westophone Phone, London	East, 3840.
White Motors & Accessories, Ltd.	Concanon Road, Brixton, London, S.W.2	Genisean, London	Brixton, 565 and 566.
Williamson, Alfred	North Mill Printing Works, Ashton-under-Lyne	—	Ashton-under-Lyne, 320.
Wiseman, Ltd., Alfred	Glover Street, Birmingham	Verus, Birmingham	Victoria, B'ham, 560 & 561
Wood-Milne, Ltd.	21, Albion Street, Gaythorn, Manchester,	Wudmiln, Manchester	Manchester City, 8774.
Woods-Gilbert Rail Remodelling Co., Ltd.	170, Strand, London, W.C.2	—	City, 5147.
Yates, John & Co. Ltd.	Aston Manor, Birmingham	Yatonian, Birmingham.	Birmingham East, 400-402
Zenith Carburetter Co., Ltd.	40-42, Newman Street, London, W.1	Zenicarbur, Ox, London.	Regent, 4812 and 4813

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